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# Imperial control in Roman and Byzantine Arabia

## A landscape interpretation of archaeological evidence in southern Jordan

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## Abstract

The dominant interpretation of Roman imperialism in the provinces of *Arabia* and then *Palaestina Tertia* holds that the Empire was seeking to combat external military threats from nomads. This interpretation is based on archaeological evidence of Roman military sites forming a static defensive system linked by a road network. Recent scholarship in Jordan has questioned this interpretation. Alternative hypotheses have been advanced proposing that these sites acted as points of provincial control or were situated to maintain routes for long distance trade.

It is proposed here that these interpretations of imperial control are flawed, either because of poorly realised explanatory models or improperly sampled datasets. In contrast, this study achieves an integration of textual and archaeological data through the conceptual framework of landscape. This approach stresses the spatial correlates of human behaviour and allows an alternative interpretation of imperial control to be validated. This study proposes the hypothesis that the aim of Roman imperialism in this area was to control directly imperial material resources. It does not present a historical reconstruction but demonstrates the power of a landscape approach over other models in the interpretation of Roman imperial control in southern Jordan.

A rigorous review of existing textual and archaeological evidence from southern Jordan to establish military spatial and temporal development concludes that the scale of military fluctuations to support the hypothesis of a desert frontier system has been exaggerated. To test this conclusion primary data from the Dana Archaeological Survey (DAS), a three-year survey project directed by the author, was rigorously correlated with existing datasets. By strictly defining military sites and emphasising these monuments as part of wider settlement pattern, the survey demonstrated that military variability was in fact highly conservative and cannot support the hypothesis of frontier defence or provincial control.

The DAS data was then used to test an alternative hypothesis that military variation is linked to the control of trade and wider socio-economic integration. This was achieved by correlating military sites with the wider settlement hierarchy through patterns of ceramic continuity. However, contrary to previous interpretations showing highly variable settlement change, the results proved that the correlation with military sites is not exact. These results were then compared with critically evaluated data from four other surveys (Wadi Hasa Survey, Southern Ghors and North Arabah Survey, Limes Arabicus survey and the Kerak Plateau Survey), which broadly supported the DAS results.

This study makes clear that there is a spatial correlation between the existence of imperial estates, industrial centres and military sites. Archaeological evidence of an imperial estate in the DAS project area is presented and is contrasted with the different spatial and temporal features of a civilian estate. This imperial estate can be spatially correlated with several military sites. A review of the historical and textual evidence for imperial estates in Arabia suggests a provincial-wide pattern. This re-interpretation of the imperial landscape in southern Jordan views the location of military sites and the road network as a part of a vast integrated resourcing system of the Eastern Empire.

For my parents

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## Preface

The cultural transformations effected by empires are widespread and usually outlast the direct period of rule. For a 21st Century Scot looking back at his ancestors that knew only the Gaelic language and a Celtic church, the processes of incorporation within the British Empire was both savage and enlightening. The story of such imperial transformations in Scotland have become the subject of much study and debate as a devolved government in Edinburgh moves away from the centralised, "imperial" control of London (Nairn 1997, Part IV).

The story of the incorporation of the Nabataean Kingdom, that covered much of present day southern Jordan, into the Roman Empire does not present us with such dramatic or personal insights such as the Highland clearances but glimpses of similar processes do occur. The use of tribal groups within the imperial military structure; the apparent ease of the local elite to co-operate with the Romans; the stream of local individuals to take up positions within the state structure bear more than a passing similarity to events in Scotland. Moreover, the coming of the new rulers in both areas led to language changes and the establishment of new religions.

This superficial similarity between my country and Jordan, where I have worked for the past decade, has lead to my interest in the various imperial phases of Jordan's history in the classical period. This has ranged from the presence of Phoenician merchants at North Shuna in the Hellenistic period (Findlater forthcoming) to the establishment of Christianity in the Wadi Arabah (Findlater *et al* 1998). This last project and work on a commercial project in the same area focused my attention on the suitability of the Faynan and Dana areas as an excellent study area for questions of imperial control investigated in this PhD. This led to the creation of the Dana Archaeological Survey on which the primary dataset of this study is based. A portion of this study has already been presented at the Limes Congress in Jordan (Findlater 2002).

The passage of this PhD has been through fair winds and foul over too many years. However, I am extremely grateful for the navigation aids provided by my supervisors, Dr Karen Stears, Professor John Richardson and especially Professor Trevor Watkins and Dr Gordon Thomas.

The Dana Archaeological Survey (DAS) was funded by the Council for British Research in the Levant, the Seven Pillars of Wisdom Trust and the Palestine Exploration Fund. This project was based on a smaller commercial project undertaken by the then Centre For Field Archaeology (CFA), University of Edinburgh for the Royal Society for the Conservation of Nature in Jordan. It is a pleasure to gratefully acknowledge the hard work and skill of the following team members:

CFA
Survey Team December 1994 - Kevin Hicks, Kirsty Cameron.
Survey Team May 1996 - Kevin Hicks, Kirsty Cameron, Alasdair Rees.
DAS
1st Season: Isabelle Ruben, Kevin Hicks, Mike Rawlings
2nd Season: Isabelle Ruben, Dominic Barker, Stuart Cakebread
3rd season: Isabelle Ruben, Dominic Barker, Paul Newson
The guides for various seasons were: Eish Juma Ali Al Azamah, Tulib Demethan Er Rashaideh, Juma Ali Sulieman Zanoon El Azazameh & Eish Auda El Azazameh.

The ceramic analysis was carried out by Charlotte Whiting (with consultation by Ben Dolinka) on whose initial archive report parts of the Chapter 5 ceramic report is based. The ceramic assistants were Claire Younger and Bronwyn Douglas. The plans were prepared by Kevin Hicks. The Department of Antiquities Representatives for this project were Ahmad Al-Shami for the first DAS season and Jihad Darwish for all other seasons

I am grateful to the present Director of the Department of Antiquities of Jordan, Dr Fawwaz Al-Khraysheh and his predecessor Dr Ghazi Bisheh for their kind permission to undertake archaeological work in Jordan. Further I wish to acknowledge the various officials and private citizens of the Governate of Tafilah and the sub-governate of Shaubak who were generous of their time and help. The success of this project is due in many ways to the staff of the RSCN in Amman and Dana for their help and co-operation in the carrying out of the survey. I am grateful, in particular, to Eduardo Zandri, Mike Appleton, Tarek Abul-Hawa, and Abu Mustapha.

It is great pleasure to ackr.owledge the staff of the CBRL in Amman for logistical support and advice in all matters especially the previous Director Ms Alison McQuitty, the Administrator, Ms Nadja Qaisi and the present Director Dr Bill Finlayson. It is also a pleasure to note the support, advice and good craic provided by the following friends and colleagues whilst in Jordan – Prof. D. Graf, Dr Z. Fiema, Dr P. Freeman, Dr T. Parker, Dr A. Walmsley, Dr T. Levy, Prof. D. Kennedy, Dr B. MacDonald, Dr R. Schick and Dr G. Philip. On a more personal note I want to thank Dr Gordon Thomas, Mr Ian Morrison and Mr Kevin Hicks for their generous and unstinting help, support and advice over the past few years.

But my greatest debt is to my wife Claire. She has put up with this "thing" for six long years and has been constantly supportive and encouraging through black moods and tantrums.

## List of abbreviations

| | |
|---|---|
| Amm. Marc. | Ammianus Marcellinus |
| Cass. Dio | Cassius Dio |
| *C. Iust.* | P. Krueger (1929) (ed.) *Codex Iustinianus, Corpus iuris civilis.* Vol. 2, Berlin |
| *C.Th.* | T. Mommsen (1905) (ed.) *Codex Theodosianus.* Vol. 1, pars posterior, *Theodosiani libri XVI cum Constitutionibus Sirmondinis.* Berlin. |
| *CIL* | *Corpus inscriptionum Latinarum.* (Berlin 1863–) |
| Geography | Ptolemy Γεωγραφική ὑφήγησις |
| *Hist. Eccl.* | Eusebius *Historiae Ecclesiasticae* |
| *IGLS* | L. Jalabert, R. Mouterde *et al* (1929-) (eds.) *Inscriptions grecques et latines de la Syrie.* Paris |
| *Mart. Pal.* | Eusebius *De Martyribus Palaestinae* |
| *N. Iust.* | *Novellae Iustiniani* Krueger, P.; T. Mommsen; R. Schoell and G. Kroll (eds.) (1904) Corpus Iuris Civilis. Volume 3 Iustiniani Novellae [xviii]. Apud Weidmannos, Berlin. |
| *ND Or.* | *Notitia Dignitatum Oriens.* Seeck (1876). |
| *Onom.* | Eusebius *Onomastikon* |
| *P. Colt* | Colt, H.D. (ed.) (1962) *Excavations at Nessana I.* Princeton. |
| *P. Yadin* | N. Lewis (1989) (ed.) *The documents from the Bar Kochba period in the Cave of Letters: Greek Papyri.* Jerusalem. |
| Rufinus *HE* | Rufinus *Historiae Ecclesiasticae* |

# Chapter 1

## Introduction

ΡΩΜΕΟΙ ΑΕΙ ΝΙΚΩΣΙΝ ΛΑΥΡΙΚΟΣ
ΕΓΑΨΑ ΧΑΙΡΕ ΖΗΝΩΝ

Romans always conquer
I, Lauricius, wrote 'Hail, Zeno'

The above quote is from an inscription found in the Hisma, a desert area of southern Jordan (Jobling 1993). While the date and author Lauricius are unknown, Zeno may be the son of Qayamat, a local Roman official in the area (*ibid.* 244). Whether the tone is one of exultation or resignation, this inscription is a personal testimony to the dominance of Roman imperial power in the region. The Hisma was then part of the Province of *Arabia* (later *Palaestina Salutaris/Tertia*), where Rome's power was made tangible by the series of forts built along the main routes in this arid environment. By the standards of the Empire they were small posts but their impact was as great as any major fortress. Situated at regular points along the road, usually controlling a large spring and surrounded by field systems or large reservoirs, the message of control and power was clear.

The dominant interpretation of Roman/Byzantine imperial activity in this frontier province, certainly in the southern sector, emphasises the overt military nature of one aspect of its material correlate; namely the forts of the so-called *Limes Arabicus*. In this view, these forts formed a defence system against external attacks and also policed the internal area (Findlater 2002, 138). This view has been advanced notably by S.T. Parker, whose massive Limes Arabicus Survey has repeatedly stressed the concept of the military frontier zone (Parker 1986a, 1987a). This concept rests on the identification and location of such sites (and the road network) and the direct threat which supposedly inspired the system. In southern Jordan it is presumed to be from nomadic tribes (Parker 1986a, 136).

Traditionally, scholars have concentrated on the larger military sites situated on the supposed frontiers of Empire and integrated this evidence with historical sources following the modern interpretation of the term *limes* (Isaac 1998, 345–346). Such research produced grand strategic explanations, which concentrated almost totally on the defensive systems and the perceived external threat that these systems countered (*e.g.* Luttwak 1979) (Findlater 2002, 138). This type of research sought to answer the dominant question in Roman frontier research: was there a unified historical aim in the defence of empire?

In response to these questions, scholars have since provided alternative theories on the tactical and strategic role of the military in the Roman period in southern Jordan (Graf 1997a & b; Isaac 1992, 1998; Fiema 1995). They contend that limited historical sources do not substantiate such a threat and that many of the historically attested military sites are situated well behind the supposed frontier system proposed by Parker. Furthermore, they see the location and variability of many military sites as being determined by economic conditions. Fiema (1991, 1995) attempted to integrate such sites into an overall settlement pattern, linking military location to trade, where fluctuations over time in military systems are seen to be indicative of larger socio-economic processes.

However, these theories have not been fully successful in establishing a coherent model to challenge Parker's Limes model. While Bowersock (1976, 1983) and Isaac (1992, 1998) argue for the deficiencies of the Limes model, they failed to establish a more coherent setting to understand the dynamics of the area. This has had implications for the wider history of Roman and Byzantine Arabia. Whittaker (1994), in his overview of the social and economic framework of the Roman frontier, hardly touches on any coherent data to reconstruct the wider frontier zone in Arabia. Similarly Millar (1993), while providing a comprehensive literary review of the evidence for Roman Arabia, only uses a small part of the available archaeological data.

The main problem is that the majority of researchers have either concentrated on the purely strategic military or architectural elements of the sites, or else have inadequately contextualised the significance of Roman military variation and change. Indeed, many hypotheses rest on one explanation for the whole 500-year period. Whether the explanation ascribed military location to the pressure of nomadic tribes, internal security or protecting trade routes, the academic arguments have become mutually exclusive or else a mixture of the three, according to the taste of the researcher. However, as Freeman (2001, 440) made clear, these debates are of a one-dimensional nature as they focus heavily on the eastern desert margins. Furthermore, all these debates have been somewhat myopic, failing to note wider structural issues such as the nature of imperialism in the specific area and the structure of local society and settlement networks. This has grave implications for the wider history of Roman and Byzantine Arabia. The lack of a more comprehensive and balanced framework of study for military sites impacts negatively on the study of Roman imperialism in the province.

Moreover, since the mid-1970s, the debate between the scholars researching the *limes* problem in Jordan has reached a point whereby competing views are presented polemically.

These are couched in explicit terms as being of two schools. One of traditional approaches (*e.g.* Parker 1997a) that sees itself as the orthodoxy, defends the concept of Mommsen's *limes* interpretation and favours a positive view of archaeological data. The other defines itself simply as not being the former (*e.g.* Graf 1997a). It negates the idea of *limes*, is hostile to overarching models of imperial strategy, and generally uses archaeological data sparingly.

Therefore, the main aim of this study is to set these military sites in a more secure explanatory model. This study does not aim to provide a historical reconstruction but to provide an archaeological framework for the origin, variation and development of military locations during the Roman & Byzantine periods in southern Jordan. This archaeological framework operates at three levels: 1) to identify the instructions that led to the development of forts and military variation; 2) to describe the range of diversity of such instructions through time; and 3) to trace the flow of cultural instructions through space. The outcome of this study offers a more balanced reinterpretation of the nature of Roman imperialism in the Jordanian part of what was *Arabia* and then *Palaestina Tertia*. In doing so it seeks to provide some answers to the main question of a coherent frontier strategy.

However, a secondary aim of this study is to demonstrate that archaeological data can make a serious and sustained contribution to the reconstruction of the Roman frontier in the East. Most scholars, in their research areas, prioritise historical data over archaeological data. Moreover, there is a growing dissatisfaction with what many perceive to be the imperfection of archaeological data. However, before the 1970s archaeological data was used quite positively, if rather inaccurately, to establish Roman military systems (*e.g.* Brünnow & von Domaszewski 1904, 1905; Poidebard 1934; Alt 1935, 1936; Stein (Gregory & Kennedy 1985); Gichon 1980, 1995). From the 1970s onwards, a more critical approach was taken which deconstructed many of the datasets used by these previous archaeologists. These new studies, such as Gregory's thorough review of military architecture, or Isaac's masterful analysis of Roman imperialism on the eastern frontier, were highly critical of the extent to which archaeological data could be used (Gregory 1997 I, 238; Isaac 1992, 6–7).

The two most recent studies of the Roman army in Egypt (Alston 1995) and in Syria (Pollard 2000), which have both offered quite illuminating insights through textual data, are considerably sceptical of the use of archaeological data. While Alston (1995, 6–7) notes the vagueness of archaeological data, Pollard makes this depressing statement: "it is rarely possible to use the archaeological evidence of military installations in the east to draw conclusions about frontier policies at certain periods. On the contrary, information from literary sources about the location of the frontier at given times may help us to date

[archaeologically?] recorded military installations" (Pollard 2000, 20 with my brackets added).

This is depressing, not because it is true, but because the body of evidence from a separate discipline is dismissed so completely that it is considered worthy only when correlated with textual data. As will be shown in this study, this is due to the almost complete misunderstanding of how archaeological data is validated. Moreover, it will demonstrate that far from being a merely corroborative dataset, the archaeological evidence presented in the following eight chapters can actually lead the debate on the nature of Roman imperialism and the military frontier in the East.

### Overview of chapters

Chapter 2 presents a history of previous research in Roman frontier studies in southern Jordan and traces the establishment of explanatory models. It situates frontier research in Jordan within the wider debate of the nature of Roman imperialism and the existence of a coherent strategy for the frontiers of the Roman Empire. The chapter outlines Parker's Limes Arabicus model and its roots in the archaeological and historical research of Jordan, and reviews the main strengths and weaknesses of his model. The responses to Parker's model are presented and critically reviewed. It will demonstrate that all models are based on poorly understood and incomplete archaeological datasets. This chapter will then outline a new model of resource control as a causative factor in the formation of Roman military strategy. The chapter will then present the case for situating this research within the concept of landscape. This approach, stressing spatial over typological links in the analysis of material culture allows an effective reconceptualisation of the research questions of military variation and development.

Chapter 3 is a thorough review and correlation of the existing textual sources of military site location throughout the Roman and Byzantine periods. This has not been attempted for southern Jordan before and will demonstrate the nature of the variation and change in military location throughout most of the Roman and Byzantine period. It is not a textual archaeology of troop movements but an examination of military site location in the contemporary landscape through space and time. It proposes radical changes to accepted notions of site location and routes. Thorough correlation of this new data will demonstrate that previously argued variations of route and military location are illusionary. In fact, military location in southern Jordan was quite conservative and change occurs only in specific areas.

Chapter 4 is a critical review of the existing database of archaeological sites classed as Roman forts. It reviews the material by sub-region within southern Jordan. Using a strict method to attribute military function, it proposes a more limited range of sites than previously thought. A thorough review of the dating evidence will show that the distribution and development of Roman forts has been poorly interpreted. Comparison of this data with the textual evidence of the previous chapter will demonstrate that military distribution cannot be used to propose models of military defence or provincial security.

Chapter 5 presents the primary survey upon which the original research was based – the Dana Archaeological Survey (DAS). DAS was designed as a three-year project to study resource control and state organisation in the Faynan, Dana and Shaubak areas of Jordan within the historically known Iron Age to Byzantine periods. The aim was to produce a record of the relationship between state/military sites and settlements within a landscape setting of resource areas and communication routes. The project recorded over 400 sites over a 1750km$^2$ area, taking over 300 ceramics samples containing *c.* 21,500 sherds. The project research strategy is presented here with a critical review of survey methodology and the framework for ceramic analysis of field samples.

Chapter 6 tests the conclusion of Chapters 3 and 4 that military variation does not suggest military defence or internal security. Using primary evidence from the DAS, the data is presented through the framework of communication routes and resource areas. However, it questions earlier interpretations of routes and proposes new lines of communication. Previously surveyed routes, such as the *via nova Traiana*, are shown to have continued in use longer than was thought. By using a strict methodology to attribute military function, clear spatial and temporal patterns are evident. When correlated with routes these patterns demonstrate that an overtly defensive interpretation of the fort system is not confirmed. This is further proven by the discovery of an Iron Age boundary system, which uses the only clear defensive position in the landscape, separating desert from sown. The main Roman and Byzantine military system is shown to have minimal correlation with this feature.

Chapter 7. The main aim of this chapter is to analyse the relationship between military sites and the rest of the settlement pattern. This will be achieved using primary quantitative survey data from the DAS, outlined in Chapter 5. A secondary aim of this chapter is to test the hypothesis that military sites and long-distance trade, as evidenced through settlement fluctuation, had a direct correlation, as argued by Fiema. It analyses the DAS settlement patterns and types to identify state *versus* civilian patterns through space and time. In doing so it emphasises the longevity of landscape patterns dating back to the Iron Age. It argues

that while there is a socio-economic link between military sites and the other elements in the landscape, the correlation is not exact. The DAS data is then correlated with data from the Wadi Hasa Survey, Southern Ghors and North Arabah Survey, Limes Arabicus Survey and the Kerak Plateau Survey. These datasets have never been fully analysed before and this represents the first attempt to investigate the data using a relational database. They broadly confirm the DAS observations.

In Chapter 8 the evidence for a spatial connection between imperial estates and the military system is presented. By correlating patterns of this resource system in southern Jordan with the historical data of the establishment of large military industrial centres (*fabricae*) in *Syria*, a strategic model of Roman imperialism can be constructed. The existence of imperial estates in the landscape has not been elucidated fully before and the textual and archaeological evidence is reviewed. However, to illustrate the unique nature of this type of large-scale estate, it is compared with new evidence of a civilian estate where different landscape and temporal factors are evident. By presenting new evidence of large-scale imperial estates, it is argued that in some areas fort location was linked to control of imperial economic resources.

Chapter 9 concludes the study by offering an interpretation of the Roman military system in Arabia as a vast integrated resourcing system. Moreover, this model allows a stricter interpretation of the controversial term *limes*. It is argued for the later Roman period, *limes* does not mean a military frontier zone but more specifically refers to an integrated military road system. This means that the term *limetanei*, far from being interpreted as second class troops or soldiers, can now be seen as specialised units designed to provide security for the movement of material to the main field armies or industrial centres.

## Chronological outline

The historical focus of this research is the period between AD 106 to the end of Roman rule following the Muslim invasion *c.* AD 634. However, it is important to realise that the chronology and nomenclature for the Classical period in Jordan is not clear. By the Classical period is meant the whole of Near Eastern history from 322 BC, with the conquest of Persia by Alexander to the end of the Byzantine rule in Jordan in AD 635. This includes the history of the Nabataean Kingdom, which is presumed to have been similar to other Hellenistic states in the region. Within this study the broad outline of the chronology used by Homès-Fredericq & Hennessy (1986, 10) has been followed:

Hellenistic 332 – 63 BC
Nabataean 312 BC – AD 106
Early Roman 63 BC – AD 106
Late Roman 106 – 324
Early Byzantine 324 – 491
Late Byzantine 491– 634

However, in this study Early Roman will not refer to the period before AD 106. This chronology was primarily designed for northern Jordanian sites which were all rather tidily organized as city states by Pompey in 63 BC. As a result they ordered their city foundations from this date (Spijkerman 1978). Within the confines of this study the research area was part of the Nabataean Kingdom until AD 106 and will be referred to as such. Thus, the period after AD 106 will be referred to as Early Roman. It is not logical when discussing, say the *via nova Traiana*, which was constructed after AD 106, to say that the building of this work was carried out in the Late Roman period. In cultural terms the Nabataean Kingdom operated within a general Hellenistic environment and was not affected by Imperial Roman material culture till much later. Further, archaeological discussion of ceramic material, by the very nature of the evidence, is carried out using the period names only.

Freeman (2001, 427) has recently pointed out the many discrepancies in the historical frameworks used for this period of research. Indeed, scholars are sometimes not clear about exact dates when referring to the Roman or Byzantine periods. Most British researchers would place the emergence of a distinct Byzantine Empire in the fifth or sixth century AD. Thus A.H.M. Jones (1964) refers to the period between AD 284–602 as the Later Roman Empire. However, Americans tend to view the beginning of the Byzantine period as being either when the Tetrachy was formed in AD 293 or later, when Constantinople was founded in AD 324. This division is also enshrined in the new *Archaeology of Jordan* volume (MacDonald *et al* 2001). Accordingly, this latter date has been followed in this study, mainly to correlate data with the majority of research in the area, which has been carried out by Americans using the above system.

## Geographical outline

The geographical area of this study is focussed at two scales. At its broadest scale it is concerned with the area of southern Jordan, from Wadi Kerak south to the present Jordanian border with Saudi Arabia. This extends from the Wadi Arabah, in the west, to the beginning of the Desert areas to the east of the Jordanian Plateau (Figure 1, page 315), roughly along the line of the present Desert Highway. The fieldwork for this study was carried out within a subset of this area, encompassing the area between the Wadi Arabah in the west and the

Desert Highway on the Plateau to the east (Figure 2, page 316). To the north, it was bounded by the Wadi Dahal and the Gharandal to Jurf Ed Darwish road. The southern boundary was delimited by the Wadi Arja. The northern part of this area, on the Plateau to the north of the Ifjeij plain, is usually referred to as the Jibal. The area to the south of the Ifjeij plain is called the Shera'a. A more detailed description of the survey area is given in Chapter 5.

During the Roman period this area was initially part of the province of *Arabia* (in reality the area covered by the previous Nabataean Kingdom). This area was described by Ptolemy, in the second century, as *Arabia Petraea* (Geography 5.16). At the end of the third century, the area to the south of Wadi Hasa was transferred to the province of *Palaestina* and joined to what is now the Negev in Israel to form *Palaestina Salutaris* (*ND Or* 1.87, 2.16). By AD 409 the province was called *Palaestina Tertia* (*C.Th.*8.4.30) and the border was moved north to the Wadi Mujib.

Southern Jordan can be characterised as three main geo-morphological units: the Rift Valley (Wadi Arabah), the Jordanian Plateau and the desert (Figure 3, page 317). The following section will describe the landscape and environment of southern Jordan through these three units. This has been based on MacDonald's (2000a, 21–43) environmental summary of southern Jordan.

### The Wadi Arabah

The Rift Valley on the southern side of the Dead Sea is known as the Southern Ghor and the Wadi Arabah. The Southern Ghor runs from Wadi Hammah, on the south side of the Dead Sea, to Ghor Fayfa, about 25km south of the Dead Sea. The Wadi Arabah is about 180km long, from the southern shore of the Dead Sea to Aqaba in the south. The width of the wadi varies between 5 to 15km. The valley floor varies in level. In the south, it reaches its lowest level at the Dead Sea (-400m above sea level), rising in the north to just above sea level.

The climate in this area is semi-arid and generally receives less than 12cm of rain at the head of the Dead Sea. Most water is carried down in wadis from the Plateau during the wetter winter months. There are several springs located at the base of the Plateau mountains which are part of the Disi formation table of water. The wadi base is composed of drifting sand and gravel plains set over limestone bedrock. Farming is only possible through intensive irrigation, or on flooded wadi plains, and thus is restricted to areas with springs. The whole of the Arabah is considered part of the Saharo-Sindian biome, a typically desert environment with a short rainy season and a long dry summer. The vegetation cover is extremely poor and occurs in wadis, depressions and runnels. The natural resources typically used in this area are

mainly mineral. The main mineral extracted in antiquity was copper ore. This exists in great quantity not only in the Faynan area but also in pockets of a seam that runs diagonally to the south-west to Timna in Israel. The Dead Sea was a major source of bitumen during the Classical period. It was also exploited for its salt content, which was a major industry during the Classical period (Hammond 1959).

The Wadi Arabah was not a border in antiquity. In fact, the present Israeli-Jordanian border is the first time in history that this geological feature has served as a political barrier. During the Nabataean and Roman periods both the Negev and the Jordanian Plateau were joined under the same political unit.

### Jordanian Plateau

This area is characterised by mountainous regions, *c.*1000–1500m above sea level, dissected by a series of deeply incised wadis, running east-west, that link the desert area with the Wadi Arabah escarpment. The western edge of this plateau country forms an escarpment along the eastern side of the Jordan River/Dead Sea. Most of the wadis that provide drainage from the plateau country into the depression carry water only during the short season of winter rains. Sharply incised with deep, canyon-like walls, the wadis can be formidable obstacles to travel and, in the past, have acted as political boundaries. However, most agricultural activity was carried out within these wadis. They also acted as communication routes between the Plateau and the Wadi Arabah. The mountains to the north of the area are dominated by limestone plateaux that give way in the south to sandstone formations.

Where the ground rises to form the highlands east of the Rift Valley, rainfall increases to around 30cm in the south and 50cm or more in the north. This means that in higher areas sustainable agriculture is possible (Figure 4, page 318). However, there are numerous springs located along the edge of the Jordanian Plateau where the mountains break into the Rift Valley. In this area, stretching as far south as the Shaubak to Petra area, there is a clear Mediterranean climate. Frost is fairly common during the winter and it occasionally snows. This area is dominated by Yellow Mediterranean soils, with a mixture of occasional Red Mediterranean (*Terra Rosa*) and Yellow Steppe soils on the margins. The soils are particularly good for cereal production and, with irrigation, can sustain more intensive production. These soils lie in a narrow strip along the Jibal and Shera'a mountains that reach to the Ras An Naqb. The plants within these areas belong to two main biomes. On the higher mountain areas the Mediterranean zone is dominant, supporting a mixed forest-maquis vegetation. In fact, the area of Shaubak is generally considered to have been more heavily wooded in antiquity, although copper mining activities have degraded this resource since the

Bronze Age. On the lower slopes of the Jordanian Plateau and to the east of the Mediterranean zone, the Irano-Turanian zone predominates. Here, herbaceous and shrub plants thrive in the Yellow Steppe soils. With a rainfall of *c.* 20cm, sustainable agriculture is very meagre and is usually only practised in flooded plains or wadis. Aside from good agricultural land, this would have been a main area for timber. However, it was probably used for charcoal production as well as construction. In areas near Dana there are basalt outcrops that can be used for grinders, querns etc.

The area to the north of the Wadi Hasa was called Moab in the Bible and was the eparchy of Moabitis in the Hellenistic period. It was bordered to the north where the Wadi Mujib cuts through the Jordanian Plateau. Known in antiquity as the Arnon, this wadi formed the biblical border between Moab and the Ammonites (*Numbers* 21.13). It was a broad area of farmland existing on good *terra rosa* soils that supported a relatively dense network of villages. This plain was dominated by the two main towns of *Areopolis* (Er Rabba) and *Charchmoba* (Kerak). To the south of the Wadi Hasa and stretching to Shaubak is the area of Jibal, which was known to Eusebius as *Gebalene* (*Onom.* 142.11). From Shaubak southwards to the Ras An Naqb escarpment there is a range of mountains called Ash Shera'a. The south-west margin of the Shera'a continues as a narrow range towards Aqaba, at the head of the Red Sea, where it ends at the Wadi Yitm. This wadi forms the major line of communication from Aqaba through the Shera'a mountain range, across the Hisma and on to the Jordanian Plateau. The Classical name of the area is unknown although Eusebius referred to an area called *Teman,* which is considered to be a southern region of Edom (*Onom.* 96.18).

### Desert

To the east and south of the Jordanian Plateau are large desert areas. They are divided into two main areas. To the east of the Plateau is the main central desert of Jordan that forms a distinctive cuesta landscape which extends for hundreds of miles to the east and south-west. There are two merging climates within this area. Near the mountain zone there is a semi-arid environment where the rainfall is between 5–30 cm. It is treated as a steppic area by Bedouin who graze sheep and goats in the area. This, however, is not a wide strip of land and gives way quickly to a completely arid environment where the rainfall is less than five centimetres annually. Although there are occasional wells, the area is avoided by Bedouin. The main soil in this area is Grey Desert that is covered with chert detritus, which is called the Hammada in Arabic. As a result, and due to severe weathering, organic matter is light and grazing hard. The plant zone in this area is the Saharo-Sindian and similar to the Wadi Arabah.

The second area of desert is to the south of main mountain areas and the central desert plateau. It begins at the edge of the Ras An Naqb escarpment. This area is referred to as the southern mountain desert. It comprises inselberg-type sandstone mountains set in shifting sands. The climate is arid and rainfall is similar to the Wadi Arabah and Desert areas. Springs occur occasionally and rain-fed storage techniques predominate.

The desert to the east has always been referred to as the Hammada while the southern mountain desert is usually called the Hisma. There were no real borders in antiquity and the modern boundaries are somewhat meaningless in these large desert areas. To the south of the Hisma, it is clear that the Nabataeans controlled territory all the way down to Medain Salih in what is now Saudi Arabia (Bowersock 1983, 1–2). It is unclear in the Roman period if there was direct imperial rule although scholars such as Bowersock endorse this view. His main support is the Ruwwafa inscription. This is an inscription found in a temple structure in Qurayya in modern Saudi Arabia. This mentions two Roman governors of Arabia and the ties of friendship with the local tribe (Bowersock 1983, 95–97). Additionally, various Roman graffiti, clearly made by soldiers, have been found in the northern Hedjaz (Speidel 1977, 705–706). This has been opposed by Graf (1978, 3–4) who argues that this is an over-interpretation of the evidence. He contends that Roman rule was indirect and soldiers were probably only present as part of long-range patrols.

The border to the east of the Jordanian Plateau did not act as a border in a political sense. Like the Nabataeans, the Romans controlled the Wadi Sirhan depression that was located further to the east. This was the main trans-humance route for Bedouin between Arabia and the Syrian Deserts. The arid area in between was of no value and can only be considered a border in an environmental sense. However, in the transitional zone between the arid desert and the mountains there are broad, open north–south wadis that allow easy movement of peoples away from the deeply dissected mountain areas. This is the route of the Darb Al-Hajj, the annual pilgrimage route made by Muslims on their way to Mecca. The route was provided with forts for protection by the Ottomans (Peterson 1994). During the Late Ottoman period the Turks built a railway along this route and today it is the main highway to Aqaba, the so-called Desert Highway.

## Historical outline

Although the Emperor Trajan was lauded by contemporaries for his great achievements, his annexation of the Nabataean Kingdom in AD 106 failed to register in any literary source of that time. It is only Cassius Dio, writing over a hundred years later, who makes a first terse

reference to it (Cass. Dio 68.14.5). However, even this reference is only contained in a Byzantine abridgement of Cassius Dio's work.

Following the death of Rabbel II, Cornelius Palma, the Roman legate of *Syria*, annexed the Nabataean kingdom with the help of troops from Egypt. The new province was called *Arabia* and a senatorial legate appointed by the Emperor governed it. The main city became *Bostra* (or Bosra), now located in southern Syria. *Bostra* was renamed in honour of the Emperor as *Nea Traiane Bostra* and the legion *III Cyrenaica* was stationed there.

At the height of its power, the Kingdom of the Nabataeans stretched from Damascus southward into northern Arabia. Their trading empire, dealing in luxury goods, linked the Mediterranean world with China, India, Persia, and Southern Arabia. For such a strategic area the Romans took measures to guard the security of the region. Trajan possibly constructed a major road, the *via nova Traiana*, from *Bostra* to (Aqaba) on the Red Sea, a distance of 267 miles. Built between AD 111 and AD 114, its primary purpose may have been to facilitate the efficient transportation of troops and government officials.

The status of Petra, the old capital of the Nabataeans, in the new province is not clear, although it continued to be a major administrative centre. It was the only city in the province to which Trajan gave the title *metropolis*. The Emperor Hadrian, who visited Petra in AD 130 on his grand tour of the eastern Roman Empire, gave the city his name, *Petra Hadriane*. Following the Bar Kokhba Revolt in Palestine, Hadrian renamed the province *Syria Palaestina*. The province of *Palaestina* still had two legions, the *VI Ferrata* in Jerusalem and the *X Fretensis* in Lejjun (northern Israel). The stability of Roman rule now permitted some forces to withdraw for service elsewhere periodically, and in the middle of the third century the *VI Ferrata* left permanently for Damascus.

Civil wars and campaigning on the north-eastern frontier, beginning in the Severan period (AD 193–231), resulted in major changes in the eastern part of the Empire. *Syria* became two provinces, and the Parthian Empire was invaded. This resulted in the annexation of Mesopotamia as a province. As a result of this increased warfare, the *VI Ferrata* was moved from Jerusalem to Damascus. During the Severan dynasty the province of *Arabia* was enlarged with the transfer from *Syria* of the modern Jabal Al Druze and Le'ja territories. The Severan Emperors also constructed several forts at the north-west end of the Wadi Sirhan, and repaired and improved roads here and along the *via nova Traiana*.

The Emperor Elagabalus (AD 219–222) granted the status of *colonia* to Petra while Bostra became a *metropolis* under a later Emperor, Philip (AD 244–249). Under the Emperor

Gallienus (AD 259–268) in AD 262, the governorship of *Arabia* was downgraded to an equestrian *praeses*. As these Emperors had strong links with *Syria* and *Arabia* this period sees the beginning of a stronger Arab presence in the imperial government.

In AD 259 the Sassanid Persians, under the energetic rule of Shapur, attacked the province of *Syria* and captured Antioch, taking the Emperor Valerian prisoner. The rich and powerful Arab trading state of Palmyra, came to Rome's aid and repelled the Persian invasion. During this period of Roman decline, Odenathus' wife, Zenobia, and his son, Vaballuthus, following his father's death, attempted to take control of the Eastern Empire. It was not until AD 272 when the Emperor Aurelian defeated them and took Palmyra, garrisoning the city with troops, that Roman rule was re-established in the East.

Proclaimed Emperor in AD 284, Diocletian (AD 284–305) quickly brought the instability of the third century to a close. To provide tighter control of the various parts of the Empire he instituted a revolutionary system of government. In AD 293 he created the tetrarchy, a kind of imperial college made up of senior and junior emperors called *Augusti* and *Caesari.* He also carried out far-reaching political and economic reforms, instituting separate branches of government for military and civilian matters.

As there was now more control exercised in the area, the Emperors maintained an almost continuous presence in the East, with a large field army based at Antioch. The strategic threat of the Sassanids had not disappeared so Diocletian (perhaps beginning earlier with Aurelian) strengthened the army on the Syrian frontier. Probably as part of this reorganisation, the *X Fretensis* was transferred to *Aila* from *Legio* in Palestine (probably in the AD 290s) and assigned the vast regions of *Arabia* south of the Wadi Hasa to a new province. The northern half of the Province of *Arabia* retained its old name, but the south, including Petra and the lands south of Wadi Hasa, became part of the Province of Palestine, *Palaestina Salutaris.* He assigned *Palaestina* to the diocese of *Oriens* and placed it under the civil governorship of a consular *praeses.*

Judaea, Samaria, the coast, and Peraea became *Palaestina Prima*, and its governor, senior to the other governors of Palestine, resided at Caesarea. Galilee, the lower Jezreel valley, the regions east of Galilee, and the western part of the former Decapolis constituted *Palaestina Secunda*, where *Scythopolis* became the usual seat of government. The reorganisation reduced *Arabia* to the northern Transjordan east of *Peraea* where a new Legion, *IV Martia*, was stationed at *Betthorus* (Lejjun on the Kerak Plain). However, there was still a single military officer, the *dux Palaestinae,* who commanded all the military units scattered across

the provinces, especially *Palaestina Salutaris*. Internal policing lay in the hands of the governors with their limited forces.

Following a period of civil war after the abdication of Diocletian, his successor, Constantine (AD 306–337), relocated imperial power to Constantinople. Constantine also converted to Christianity and proclaimed it the new religion of the Empire in AD 313. This meant that *Palaestina*, *Arabia* and *Syria* had a new focus as the birthplace of the new religion. In addition to a new religion, the eastern Empire, during the fourth century, underwent a cultural transformation as Greek replaced Latin as the official language. These cultural developments were mirrored in the political division of the Empire into East and West following the death of the Emperor Theodosius in AD 395.

Starting with the reforms of Diocletian and carried on by his successors, the older republican institutions of the Principate were replaced by more authoritarian institutions. Now the governors of provinces had direct control of the cities. It was they, not the local elites, who administered local justice. More importantly, they collected taxes directly and redirected the income mostly to the imperial centre. However, during the fifth and sixth centuries the supervision of revenue passed from the governor to the local agents of the praetorian prefect.

As was noted above, Arabs had gained increasing power within the imperial system from the second century onwards. During the wars with the Sassanids, both sides had begun to use Arab tribes in their armed forces. Admirably suited to warfare in arid environments, their military power soon reasserted itself politically. During Constantine's reign, one Arab leader, 'Imru al-Qays, styled himself "King of the Arabs". While not historically correct, it highlights the political ambitions of these tribal leaders. By the late fourth century, one tribe, the Salih, had become a dominant force in *Syria*, *Arabia* and *Palaestina Salutaris*, and served as *phylarchs* (tribal commanders) until the reign of Anastasius (AD 501–505).

Other tribal groups began to jockey for power and these nomadic movements soon became (similar to the problems on the Empire's Rhine and Danubian frontiers) a matter of great concern. The Kinda tribe, from an area now in northern Saudi Arabia, raided *Palaestina* during AD 498–502 to wrestle control of the area from the Salih. The Emperor Anastasius, faced with the choice of an expensive war, concluded a treaty with them and made their leader Harith a *phylarch* in *Palaestina Tertia* (The province's name had changed in AD 409 from *Palaestina Salutaris* to *Tertia*). This situation repeated itself many times as other tribes moved into the area. By the late fifth century, the Ghassanids raided *Palaestina* and *Arabia*, and the Romans recognised their power in the province of *Arabia*. During the Persian wars, the Emperor Justinian recognised the Ghassanids as the supreme *phylarch* of the Arabian

frontier from Palmyra to Aqaba. Justinian's aim was to shift control of frontier defences to the local tribes, thereby freeing up Roman troops for the main central field armies.

These Persian wars of the sixth century had followed a period of relative peace in the area. However, Justinian had to fight three wars with the Persians, and thus had to institute some provincial reforms. As a result, in AD 536 he upgraded the governor of *Palaestina Prima* from ordinary or consular to proconsular rank, the highest rank available to provincial governors (*N. Iust.* 103). He also increased the governor's authority over *Palaestina Secunda* and *Tertia* and granted him limited military powers with which the *dux Palaestinae* could not interfere.

Although Justinian concluded a peace treaty with the Sassanid ruler Chosroes in AD 532, warfare continued until AD 562. However, the Emperor Justin II withdrew support from the Ghassanids during another period of warfare in AD 581. As a result of Justin's action, the tribe ravaged the territory of *Palaestina*, *Arabia* and *Syria*, weakening an area already hit by plague and financial problems. This meant that when the Persians invaded Roman territory in AD 613 they quickly overran the whole area. The Persians gradually occupied the eastern parts of the Empire and, in AD 613, took Damascus. Then they occupied all of *Palaestina* and *Arabia*. They took *Aelia Capitolina* in AD 614 and the province of Egypt in AD 619, denying the corn supply to Constantinople. The Emperor Heraclius (AD 610–641) counter-attacked and recovered *Palaestina* and *Arabia* in AD 628.

There was not enough time to reoccupy these southern areas before the Empire was attacked by forces inspired by the new religion of Islam. Following initial raiding from AD 629, where *Aila* had surrendered in AD 630, the full invasion began in AD 634. *Areopolis* (Er Rabba) was the first to fall and then the Arab army moved across the Wadi Arabah to Gaza. The attack continued northward until, after the Battle of the Yarmuk (August AD 636), the Byzantine army withdrew from *Palaestina* and *Arabia*. Jerusalem held out until the spring of AD 638, while Caesarea was the last to fall in AD 641 or 642. The Muslim conquest ended five centuries of Roman control in the region.

# Chapter 2

## Previous research and theoretical framework

### Introduction

This chapter presents a history of previous research in Roman frontier studies in southern Jordan and traces the establishment of explanatory models. It situates frontier research in Jordan within the wider debate of the nature of Roman imperialism and the existence of a coherent strategy for the frontiers of the Roman Empire. The chapter first focuses on Parker's Limes Arabicus model and its roots in the archaeological and historical research of Jordan then reviews the main strengths and weaknesses of this model. Next, the responses to Parker's model are presented and critically reviewed. Finally, a new model of resource control as the causative factor in the formation of Roman military strategy is presented within a landscape framework, which, it is argued, allows the successful integration of archaeological data with the research questions of military variation and development.

### Development of the Limes Arabicus model and Grand Strategy

The Limes Arabicus model developed by Parker (1986a) to interpret Roman military remains in southern Jordan forms part of a general debate on the nature of Roman Imperialism and the existence of a unified policy of frontier defence. This debate has been one of the central themes of the Limes Congress. These conferences were explicitly designed to analyse, interpret and present research on the military remains of the Romans on all frontiers of the Empire. The key question encountered again and again in these conferences has been whether or not there was a coherent aim in the defence of Empire. Traditionally, this debate has been centred on the British and German frontiers of Rome which reflected the greater depth of research in those two countries. Moreover, a subsidiary debate has ensued around the effectiveness of archaeological research to answer these questions.

By the 1970s the view that Rome's frontiers were so varied that they could not reflect a unified policy was the paramount theme in the debate (*e.g.* Mann 1974). Each frontier area was considered a separate entity subjected to the specific demands and pressures of the area. This theme was spurred on by the development of regional archaeological surveys that integrated military remains with the wider settlement patterns of frontier areas. These regional surveys consistently emphasised the unique nature of the connection between the Roman military and the local area.

However, in 1976, an American political scientist, E.N. Luttwak, presented a view of the Roman Empire where the control and development of frontier defences was part of a centrally controlled policy by the Emperor (Luttwak 1979). Although relying on secondary works of synthesis, he based his model on the archaeological remains of the frontier areas coupled with detailed expositions of troop logistic and arms. For his chosen period of study, he defined three broad phases of development from the Early Principate (*c.* 27 BC) to the end of third century. His work, although subject to much review and criticism, represented a turning point in the way Roman frontiers were viewed and provides a relatively useful model for the combination of archaeological and historical data (Badian 1977, Brunt 1978, Jones 1978, Mann 1979, Millar 1982, Isaac 1992).

Luttwak proposed that the military defences of the Empire during the first three centuries AD were controlled centrally by the Emperor or his direct entourage with a clear strategy for the control and development of the frontier. He held that during this period, the strategy of military defence evolved through three distinct stages. The first stage, in effect during the Julio-Claudian period, saw the Romans maintaining their military forces in a few strategic locations and using client kings to defend the frontier. This approach, in reality a continuation of Republican methods, allowed them to use the "empire's potential military power [which] could be converted into actual political control at a high rate of exchange" (Luttwak 1979, 19).

However, as a result of the strain of civil war in AD 69, the Empire changed from a hegemonic empire to a territorial one (Figure 9, page 323) with imperial forces replacing client armies in the policing of the frontier. This necessitated the construction of a diverse material infrastructure to house and transport the military in the frontier zone. Termed "scientific frontiers" by Luttwak (*ibid.* 60), this new system comprised forts, towers and roads that were highly integrated by a rapid communication system. However, these frontiers ranged from continuous barriers, such as Hadrian's Wall, to more open arrangements that dealt with highly mobile forces. In the southern Levant, the frontier arrangement involved mobile patrols, efficient road systems and the garrisoning of major watering holes (Figure 10, page 324), to deal with what Luttwak classed as low intensity threats from nomadic tribes. He specifically referred to the Negev as an example of this type of low intensity military framework, the reconstruction of which was mainly based on the archaeological work of Gichon. However, in addition to such a strategic role, Luttwak maintained that these forces operated under a second system of "preclusive" defence (*ibid.* 74). This aimed to

provide a major element of civil control within the military frontier as well as a more closed border for the Empire.

During the third century, as a result of dynastic instability and increased foreign invasions, which led to economic instability, the Empire was considerably weakened. In the later third century this situation was rectified by a series of far reaching reforms, usually credited to the Emperor Diocletian, that resulted in the government becoming far more invasive in public life and a large part of the economy being tied to imperial defence. Here the military system changed to one of defence-in-depth which was based "on a combination of static frontier forces and mobile field armies" (*ibid.* 132). This required the creation of command areas that occupied broad zones. Luttwak considered the province of *Palaestina Tertia* (occupying what is now southern Jordan and northern Negev) an "extreme example" (*ibid.* 160) of this system. Basing his evidence entirely on Gichon's archaeological research in the Negev (for an overview, Gichon 1980), Luttwak held that this was a province designed to sustain a military system to protect the southern Levant from nomadic incursions. He noted the building of more defensive fortifications, the upgrading of defences for watering holes, signal stations and roads.

Luttwak's work has been regarded as a highly influential attempt to provide a schematic model for the creation and development of the military frontiers of the Empire (Brunt 1978). It has been used by many scholars as a framework for analysing various regional frontier studies. Jones (1978) used Luttwak's scheme to detail the development of Hadrian's Wall, and Willems (1986) directly used Luttwak's framework to analyse regional interactions on the Rhine frontier. Ferrill (1991) extended Luttwak's view of grand strategy by including the Roman ideology of war as a major element in strategic thinking. Wheeler (1993a, 1993b) further supported this view, in a series of stoutly presented articles, endorsing Luttwak's model through a thorough review of the methodologies of opposing researchers. However, Luttwak has been heavily criticised by classical historians for his sparing use of primary textual material (Isaac 1992, 5). Certainly he provides no diachronic examination of the ancient meaning of *limes* or any lengthy discussion of the government bodies behind the creation and development of these integrated systems. Some of these critical replies are outlined below but some archaeological observations that have not been covered by the overtly historical reviews of Luttwak's work should also be noted.

In the mid-1970s work had not yet begun on the Arabian frontier and Luttwak could only quote Bowersock's 1971 article, which provided an overview of research from the earlier part of the century. In fact, Bowersock's article specifically called for fresh work to be done,

of which Parker's was the first attempt (Parker 1976). However, Gichon had carried out research in a series of surveys and excavations in the Negev (Gichon 1971). Gichon's work provided a seemingly comprehensive and authoritative view of the Roman military. Although it is now rightly regarded as an over-interpretation of military monuments in the landscape (Shatzman 1983, 1991), Luttwak based all his interpretations of the Arabian frontier on Gichon's work (Luttwak 1979, 78). Luttwak did not explain why Gichon's work could be applied to a completely different area covering the desert fringe of Jordan and Syria. Indeed he does not refer to any archaeological investigations of the area such as Brünnow & von Domaszewski (1904, 1905) Alt (1935, 1936), Frank (1934), Stein (Gregory & Kennedy 1985) or Glueck (1934, 1935, 1939). This is quite remiss as Bowersock referred to them all in his discussion (Bowersock 1971, 236–242).

A dominant view that has prevailed since the end of WW2 until the present has emphasised the ad-hoc nature of Rome's continual adjustments on the frontiers. This was usefully summarised by Mann (1974) who argued basically for the separate nature (and thus development) of each frontier. He thus denied the existence of a centrally planned approach to the defence of the frontiers. Reviewing the history of imperial control he noted that "strategy in the hands of successive emperors formed no coherent pattern" (Mann 1974, 514). Moreover, he viewed the implementation of static frontiers as evidence of the decline of the Empire. Although Luttwak has emphasised that the change from a hegemonic Empire to a territorial one with fixed defences used up a lot of military potential, Mann emphasised the loss at a political level. He noted, "as the line acquired increasing definition so it required an increasing degree of control, not only for the minor bureaucratic function of customs collection and the prevention of smuggling and cattle raiding, but also, and more importantly, for the political control of movement across the line" (*ibid.* 512). In his discussion of the eastern frontier, in the province of Arabia, he maintained that the line of the *via nova Traiana* was not conditioned by military needs but by the presence of existing trade routes.

In his 1979 review of Luttwak's book, Mann continued these themes and rebutted Luttwak's main thesis. He again stressed the variety of frontier defences in the Empire, which militated against any attempt to produce a coherent model of imperial strategy. He noted that the Romans had no comparable "institute of strategic studies" (Mann 1979, 180) to analyse the frontier. This would suggest that the Romans initiated policy, but Mann maintained that they reacted to the local circumstances of each frontier. However, he did not suggest that all of Luttwak's models were wrong. In his discussion of the defence-in-depth concept (*ibid.*

180–181), while he maintained that Diocletian's reorganisation did not result in this concept being applied across the Empire, he accepted that the Arabian frontier could be interpreted in this light. He specifically noted that work in the Negev has demonstrated this. Unfortunately, he did not reference this work but it can only refer to Gichon's research (*e.g.* Gichon 1971). However, Mann cited Bowersock's 1971 summary of work on the Arabian frontier to show that "only on the eastern desert frontier, among all the frontiers of the Empire, can one convincingly argue for a planned and coherent system" (Mann 1979, 181). Unfortunately, he does not elaborate on whether this was specific to the period of the Tetrarchs or the whole period of Roman eastern frontier defence.

Mann's view of an Empire that reacts to events was very clearly outlined by Millar (1977) who carried out a wide-ranging structural study of the office of Emperor and the decision-making elements therein. He showed that the Roman Government rarely proposed policy but rather reacted to the pace of events. He argued that the Romans did not possess the government bodies, which could store and analyse data, to make and develop long-term policy. Unfortunately, Millar did not deal with the military aspects of the Emperors' rule in his 1977 work. He responded to this by publishing an article in 1982 (Millar 1982) that held to his 1977 view that even in frontier affairs the Emperor rarely directed events. He noted the poor condition of ancient lines of communication and the time it took for information to move between frontier and capital. Using this structural argument he maintained that this militated against any long-term strategy of the kind propounded by Luttwak. This would of course mean that the archaeological remains could not be interpreted in his light. However, Millar's work is highly dismissive of archaeological data and clearly views textual data as inherently more reliable. He contends that textual data "may serve the purpose of preventing the interpretation of archaeological evidence in the light of naïve assumptions as to information, communication and responsibility" (Millar 1982, 20). Somewhat surprisingly, he further held that even if evidence of strong patterning of military sites in the archaeological record was demonstrated, "we must still ask whose knowledge and whose plans" (*ibid.* 21).

Similarly, Campbell (1984) followed Millar in emphasising the lack of a general staff to plan and co-ordinate military affairs. These structural limitations were further developed by Mattern (1999) who demonstrated that the Emperor and his elite made military decisions, not on rational basis, but on the basis of the aristocratic values of honour and revenge. In part substantiated by Lendon's (2001) demonstration of these values in many segments of imperial society, Mattern concludes that these aristocratic values showed in the rudimentary

fiscal control of the Empire's economics. Careful planning was unknown as most Emperors resorted to short-term policies to raise money (Mattern 1999, 142). However, she denies the concept of a defensive strategy of Empire as most Emperors were not concerned about stopping barbarians at the frontiers but about instilling fear of Roman reprisal and revenge (*ibid.* 115–122). Mattern doubts that economic rationalisation is behind the existence of Roman frontiers or formed major segments of military thinking. However, she admits that this may be due to limited evidence (*ibid.* 149).

Whittaker (1994), in his discussion of the socio-economic nature of Rome's frontiers, clearly demonstrated the extent to which economic activity bound the cultural life on both sides of the frontier together. Using frontier models derived from America (Turner 1893) and China (Lattimore 1962), Whittaker argued that Roman frontiers were distinct cultural areas which developed in a different way to the core (Whittaker 1994, 31–60). Using a combination of historical and archaeological data, Whittaker demonstrated the rise of specific frontier economies "that created a frontier society that was fast becoming indistinguishable from that beyond" (*ibid.* 223). These local conditions were more influential in the variability of military frontier systems (*ibid.* 98–131). However, although Whittaker's study uses a great deal of archaeological material, as Freeman (1996b, 468) noted, his treatment of such material is elementary. Moreover, his treatment of the Eastern frontier is scanty in comparison to the western areas discussed. This is mainly due to the lack of synthetic works of the areas, which Whittaker relied on for his study of the western segment. However, studies of the Eastern Empire have not recognised the full socio-economic base of the frontier areas.

The most comprehensive study of the Eastern frontier and Roman imperialism carried out to date did not deal with socio-economic issues in any detail. *The Limits of Empire* by B. Isaac (1992) represents the most detailed study of Roman frontiers and Imperial policy which provided a critical analysis of the concept of *limes* and grand strategy. Isaac (*ibid.* 375–376) denied completely the existence of Grand Strategy, as argued by Luttwak, but affirmed the almost constant aggressive attitude of the Romans towards the various Persian powers (*ibid.* 19–53). He echoes Millar's (1982) view that the institutions of state were not designed to support such a policy. In particular, there was no officer class or central command (Isaac 1992, 383) to co-ordinate strategic policy. He maintains that frontier lines were not conditioned by deliberate design (*ibid.* 387). In fact, he held that Roman *limites* are not lines of defence but mere communication routes for the deployment of troops for internal security only (*ibid.* 101–160). Isaac based much of his study on a detailed archaeological analysis of

material from Israel. While much of his treatment of the archaeological data is open to criticism (as will be discussed below), his analysis presents a formidable challenge to those, such as Parker, who wish to demonstrate that the military remains of the Romans represent conscious frontier policy.

Isaac's (1992, 372–418) treatment of the concept of Grand Strategy as a model for Roman imperialism postulated by Luttwak (1979) was highly critical of the fact that this was not articulated by any ancient source (Isaac 1992, 416). Moreover, he accused Luttwak of an "anachronistic attitude" when imposing modern notions of systems on the ancient sources (Isaac 1992, 376–377). Isaac's outlook is similar to Mattern's (1999) study of the notions of honour and revenge where Roman imperialism was interpreted solely as a direct expression of the participants. While it is clear that the Romans had a clear idea of their status in the world and their right to govern and direct subject peoples (Woolf 2001; Ando 2000), this only demonstrates one aspect of the total imperial or colonial experience. Thus when Bénabou (1976), in his discussion of the impact of Roman power in North Africa, contends that the Romans were intent on a deliberate civilising mission, he is really only furthering Roman ideology. As modern studies of imperial/colonial situations make clear (*e.g.* Osterhammel 1997; Fanon 1989), a balanced picture of the imperial process is far more complex than mere demonstrations of ideology.

Indeed, Isaac never seriously challenged Luttwak's (1979) overall model of the nature of Roman imperialism. Luttwak's model demonstrated the Late Republican and Early Principate state as a hegemonic empire where Roman military force was concentrated in selects areas. Border and internal control of frontier areas were left to client kings. However, during the first century the Empire annexed these client kingdoms (of which the Nabataean was one of the last). This meant that military force was deployed over a wider area. He termed this the territorial empire (Luttwak 1979, fig. 1.2) (Figure 9, page 323). Moreover, Luttwak contrasted poorly the efficiency of the hegemonic system (where, in the East, the bulk of the legions were based in Syria as strategic reserve for purely military purposes) with the territorial system (where all manpower was distributed along the frontiers).

Luttwak clearly regarded his model of Empire as capable of comparative robustness where he evaluated his systems using modern concepts of efficiency (Luttwak 1979, 191–194). He favoured the hegemonic system as "the reach of Roman power and the costs of its military forces need not...be proportional" (*ibid.* 192). This opinion derives more from a 1970s American reluctance, post-Vietnam, to see foreign military deployments as effective. However, Luttwak's model of the territorial /hegemonic empire was used quite successfully

by other scholars, for example for the Aztec Empire by Hassig (1985, 1988 & 1992), and for the Inca by D'Altroy (1992).

Luttwak noted the massive structural changes as the Army took control of a variety of functions previously undertaken by Client Kings, such as frontier defence, border patrols, custom duties etc. Isaac does not acknowledge the validity of this as a concept but, in a discussion of the military remains along the desert fringe, concludes that they were designed for internal security (Isaac 1992, 213–218). In fact, he seems unaware that this military change was precisely one of Luttwak's structural transformations that the switch to the territorial Empire entailed. Mattern (1999, 123–161) makes clear the Romans had a limited view of the economic and military price of Empire. This was partly because their concepts of success or failure were "articulated in the realm of psychology, morality and status" (*ibid.* 122). Moreover, the lack of an explicit articulation by ancient sources (*cf.* Isaac 1992, 375) of the structural changes affected by this transformation does not invalidate Luttwak's observations. However, one should note that Richardson (1991), in his examination of the use of the word *imperium*, clearly sees a change in its use to mean "power for magistrates" in the Republican period to meaning "territorial domination" in the later first century BC/ first century AD. This would seem to correlate with Luttwak's change of system model.

### Archaeological research background to Parker's Limes Arabicus model

While the first section of this chapter summarised the wider context and recent themes of the *limes* debate, Parker's concept of the *limes* was rooted in the development of more than 80 years of research on the Roman frontier in Jordan, Syria and Palestine. In his 1986 book, Parker specifically cites Bowersock's (1971) outline of the history of Roman Arabia as the stimulation for his research (Parker 1986a, 4). Bowersock's article has been seen by many other scholars as crucial to the growth of Roman frontier studies in Jordan (Kennedy 2000, 20). Using mainly textual and epigraphic material, Bowersock began to piece together a historical framework of a period that previously had been rather unclear and controversial. The full flowering of this research was his 1983 monograph, *Roman Arabia,* which firmly established the history and development of the province.

However, Bowersock's initial article was a summary of previous research carried out in Jordan. In particular, he called for a re-examination of the Roman frontier system, the study of which had languished since the 1930s. The section below will outline the development of fieldwork of Roman military remains during three periods: Pre-WW1, the Mandate period between the wars and post-WW2, after the creation of Israel until the mid-1970s. It will

emphasise how the methods of fieldwork in these periods formed the framework for subsequent research until the present.

### Pre-WW1

As a result of the reoccupation of southern Jordan in the late nineteenth century by the Ottoman Empire, scholars could travel more safely in the area. The increased security provided by the garrisons of the Hejaz pilgrimage route and the building of the new German financed Hejaz Railway allowed, in 1897 and 1898, two German scholars, Rudolph Brünnow and Alfred von Domaszewski, to carry out a series of systematic surveys which laid the basis for modern archaeological research of the Roman and Byzantine period in southern Jordan. They surveyed an area from Ma'an northwards to the Hauran area in southern Syria (Figure 5, page 319). The outcome of this work was a series of volumes, *Die Provinicia Arabia* (Brünnow & von Domaszewski 1904, 1905; also Brünnow 1909), which attempted to describe and analyse the frontier systems of the Roman and Byzantine period. Their work set out to demonstrate the concept of the "inner" and "outer" *limes* as described by Ammianus Marcellinus in his description of the military frontier (Amm. Marc. 23.5.2). As the concept of using surface artefacts to date sites was not fully established, they based their analysis on the shape and layout of sites which had been more firmly established in the western Empire, especially in Britain and Germany (see Lander 1984).

The results of their detailed observations established the existence of a major Roman road running along the spine of the Jordanian Plateau. Termed the *via nova Traiana* from inscriptions found on the milestones, the road was clearly associated with a series of military forts along its route. However, 20km to the east of this road they also discovered a series of milestones running along the Hajj route (and the then new Hejaz Railway). A series of forts was also found along its route. The presence of these roads was firmly shown to be part of an extensive network in Thomsen's (1917) inventory and map of the Roman road system in the Levant (Figure 5, page 319). Both these studies seemed to demonstrate the existence of the inner and outer *limes*.

During this period and after WW1, a detailed examination of ancient place names was also underway, mainly by German scholars. The identification of ancient place names in the southern Levant with a specific locality began during the nineteenth century as the Bible was beginning to be studied as a historical text (see MacDonald 2000a for a short history). Many scholars began to locate Biblical and Classical sites in Palestine to try to tie events and the landscape together. Successive generations of scholars carried out toponymic surveys of Palestine and Jordan using evidence from ancient texts, archaeological data and the modern

Arabic names to piece together an ancient geography of Palestine and Jordan (Abel 1933, 1938; Klostermann 1904; Musil 1907–08; Thomsen 1903, 1906). The value of correlating ancient place names with archaeological remains was later fully demonstrated by Alt in his reconstruction of the Roman road and military system of Jordan and Israel in the 1930s (Alt 1935). Unfortunately, this method was not used fully in later research.

### Mandate Period

After WW1 research in Jordan did not pick up again until the establishment of the Mandate system when the British governed the area under the League of Nations. As in the French Mandate of Syria, the British established a Department of Antiquities to provide a secure framework for research in the area. At the end of the 1930s, using RAF planes, Sir Aurel Stein carried out aerial surveys of Jordan and Iraq where he noted the *limes* from Syria to southern Jordan. As he did not publish this project during his lifetime it had no influence on later work in Jordan. Unfortunately his work was not published until the 1980s, by which time some information had been lost (Gregory & Kennedy 1985). Stein's work was inspired by similar surveys of Syria carried out by the Frenchman, Père Antoine Poidebard, during the 1930s (Poidebard 1934). Poidebard's work mapped out a military landscape of roads, forts and fortresses of great complexity and scale. His analysis was based on the shape and layout of sites and not on surface artefact patterns (Gregory 1997 I, 28–31). His work, therefore, is similar in its overall framework to Brünnow and von Domaszewski's.

More significant to later Jordanian research, however, was the work of two German scholars, Frank and Alt, who carried out a survey of mainly Roman sites in the Wadi Arabah (Frank 1934; Alt 1935) in the 1930s. Not only did they document sites, but they also began to describe the topography of the area, which allowed military sites to be seen more fully as part of the wider landscape. Alt linked his study of place names with this archaeological data to provide a more complete picture of the Roman military in Jordan (Alt 1936). According to Lindner (Lindner *et al* 2000, 535), Frank may have been carrying out intelligence work as he had been a spy in Jericho during WW1. However, Frank, while making careful plans of the sites he visited, also took note of the ceramics lying on the surface. Unfortunately, he lacked a proper framework for these observations and consequently they cannot be used to great effect.

Although not specifically interested in the archaeology of the Roman period, the American Nelson Glueck, contributed hugely to the development of research in Jordan where he was especially interested in the Iron Age Kingdoms of the Bible. As a result of his various surveys of Jordan during the 1930s (Glueck 1934, 1935, 1939), where he used the new

ceramic chronologies developed by Albright in Palestine (Albright 1932b), Glueck was the first in Jordan to use surface artefacts and site distribution maps to analyse the socio-political history of the prehistoric past. This represented an important step forward for archaeological research in this area. He demonstrated the existence of Iron Age kingdoms by the distribution of site types with chronologically diagnostic ceramic artefacts. Although most of his conclusions have been overturned by subsequent work (*e.g.* Sauer 1986b), it is important to note that the methodology for inferring history from surface artefacts remained the dominate survey technique in Jordan until the 1980s. Further, the theoretical framework of his research based on culture history methods, namely that highly patterned groups of artefacts can be used to infer past socio-political activities, remains the basis for most historical reconstructions of Jordan to this day.

### Post-WW2 to the 1970s

With the establishment of the State of Israel in 1948, the research trajectories of the Negev and southern Jordan followed very different courses. Although there was archaeological work in southern Jordan, in the period after WW2, it was primarily concerned with the Nabataeans (*e.g.* Hammond 1973). Similarly, in the Negev most work concentrated on the Biblical Iron Age periods. However, there were several scholars who did begin to study Roman military remains in southern Israel, spurred on by the meeting of the Limes Congress there in 1967.

Foremost among these was Gichon, on whose work Luttwak had depended. Gichon had attempted to develop the concept of a Flavian period (AD 69–96) military defensive line along lines suggested by Alt for the Wadi Arabah in the 1930s (Alt 1935). He termed this the *Limes Palaestinae*, which was taken from the later Byzantine writer Rufinus (Rufinus *HE* 2.6) – "*Palaestini et Arabici limitis*". Through survey and excavation (see Gichon 1980 for overview) he built up a very forceful picture of Roman military control. No doubt partly based on his own extensive military experience, his work was widely accepted (*e.g.* Bowersock 1971). However, recent critical analysis of his survey evidence (Shatzman 1983; 1991, 239–246) demonstrates that Gichon is guilty of frequent over-interpretation of archaeological data.

In southern Jordan, meanwhile, the study of military remains, and those of the Classical period in general, had indeed "languished", occasioning Bowersock's 1971 call to arms. However, during the 1970s, numerous American research projects contributed to a massive extension of archaeological knowledge mainly by undertaking regional surveys of central Jordan. A cross-disciplinary approach and the more rigorous use of modern analogous

activities to inform on past activities distinguished these new projects. One of these, the Hesban Project, with a regional survey and excavation project centred at the site of Tell Hesban, *c.* 24 km south-west of Amman, revealed an occupational history from Iron Age I (*c.* 1200 BC) to the Middle Islamic period (*c.* AD 1500). Of particular relevance to Roman archaeology was Sauer's elucidation of a secure ceramic chronology (Sauer 1973) for the later Hellenistic to early Islamic period. This was the first secure chronology of the Classical period developed in Jordan that did not primarily depend on the Palestinian chronologies.

Most of the American survey projects in Jordan adopted Sauer's ceramic chronology. Regional survey projects in the area, like the Hesban Regional survey, now used it to reconstruct an extensive socio-political reconstruction of central Jordan. Meanwhile, from 1978–1982 in southern Jordan Maxwell Miller and Pinkerton surveyed the entire Kerak Plateau eastwards to the desert fringe (Miller 1991). Parker conducted another extensive survey, mainly to the east of this Kerak area straddling the Desert Highway routes, as part of his Limes Arabicus project which centred around the excavation of the Roman legionary camp of Lejjun (probably the site of ancient *Betthoro*), *c.* 15 km east of Kerak (Parker 1987a). To the south of the Kerak Plateau, on the southern bank of the Wadi Hasa, traditionally the frontier between Moab and Edom, MacDonald conducted an extensive survey in the 1980s (MacDonald 1988). MacDonald also carried out a survey from the southern edge of the Dead Sea southwards along the Wadi Arabah to the Wadi Fidan and the copper mines of Faynan (MacDonald 1992). Also in the 1980s, but still as part of this process, a regional survey of a large area centred on Udhruh, a large legionary fortress, was undertaken by Killick (Killick 1983a, 1983b). Further south, in the Hisma, Oleson carried out a survey and excavation of another military site at Humayma (Oleson 1988, 1990; Oleson *et al* 1993, 1995, 1999). These southern Jordanian surveys provided, at least until the 1990s, the most extensive coverage of ancient settlement patterns in the whole of Jordan. In particular, MacDonald's Wadi Hasa survey has been used in Classical archaeological literature for regional synthesis (Alcock 1993).

### Creation of the Limes Arabicus model

Parker's (1976, 1986a) Limes Arabicus model is clearly situated within this explosion of American archaeological work. These surveys demonstrated the large scale and complexity of Classical settlement on the Jordanian Plateau. They also fully demonstrated the strength of surface surveys when these were correlated with a relatively secure ceramic sequence. While Parker's subsequent work has been widely criticised (see Freeman 2001, 446–447 for an

overview), the initial importance of his work as the first attempt to provide secure dates for military distributions since the 1930s must be acknowledged.

Parker initially carried out a survey of 41 Roman military sites covering the whole of Jordan, which were published as a short article (Parker 1976). This work formed the basis of his doctoral dissertation (Parker 1979). Moreover, the overall conclusions of his 1976 survey were tested by a more limited but intensive survey and excavation of Roman military sites on the edge of the Kerak Plain (Parker 1987a). Parker's Central Limes Arabicus Survey had a clear research strategy that aimed to account for the massive Roman military build-up on the Jordanian Plateau *c.* AD 300, and for the subsequent abandonment of that system two centuries later prior to the Muslim conquest of the area (Parker 1987a Part I, 4–5). Data from both these projects was used in Parker's (1986a) major synthetic work on all the military sites of the Roman frontier in Jordan.

Although Parker's (1976) initial study of the *Limes Arabicus* appeared in the same year as Luttwak's *Grand Strategy of the Roman Empire*, Luttwak's work would appear to have vindicated Parker's view of the frontier as an integrated militarised zone running the length of the desert margin. Indeed, in Parker's major 1986 work, *Romans and Saracens*, he specifically cites Luttwak's research and models as showing the *limes* as a "scientific frontier" specially designed to provide bases and communication routes to repel invading forces. His model of the *limes* was straightforward: "The *limes* consisted of a number of camps, forts, and watchtowers, which were linked together by a system of roads. Stretching southward from the provincial capital of Bostra, the *Limes Arabicus* extended through Jordan to Aqaba....All told it defended some 360km of frontier" (Parker 1976, 19).

Parker's 1986 work remains the model for his view of the *limes* and is still regarded as the most comprehensive work of the Roman military material infrastructure in Jordan (Kennedy 2000, 20). He divided the discussion of the frontier into three broadly defined geographic areas of north, central and south Jordan. Within the confines of this study, only the southern sector of this work, from the Wadi Hasa southwards, will be discussed in this chapter (Parker 1986a, 87–114).

Through survey and excavation, Parker attempted to demonstrate this sector by pinpointing military site and routes, then determining dates of occupation using ceramic chronologies. He correlated the rise and fall of sites, observed through the presence or absence of ceramic horizons, with historically known political or military events. He then constructed a historical narrative that sought to explain the development of the *limes* throughout the 500

years of Roman rule. He concluded the following stages in the development of the frontier (Parker 1986a).

On annexation of the Nabataean Kingdom in AD 106, the Roman military used the existing military network, although this did not seem to include the areas to the south in what is now Saudi Arabia. The Romans also constructed a road, the *via nova Traiana*, that linked *Aila* (modern Aqaba at the head of the Gulf of Aqaba) to the main legionary base at *Bostra* (modern Busra in southern Syria).

During the reign of Septimus Severus (AD 193–211) the northern sector defences were considerably strengthened, especially around the Wadi Sirhan. According to Parker this was in response to nomadic incursions, probably related to Severus' eastern campaigns in Mesopotamia, when widespread repair of the road networks was undertaken. The military defences of central and southern Jordan seem to have been stable in comparison during this period.

After *c.* AD 250 the Arabian garrison was denuded as troops left to cope with increasing problems occasioned by Persian incursions and the subsequent Palmyrene bid for power. Repairs to the *via nova Traiana* also seemed to have stopped by the mid-third century. Following Aurelian's restoration of Roman rule over Palmyra in AD 273, there was a resurgence of activity on the Arabian frontier. Usually credited as being an element of Diocletian's reforms, but probably begun earlier, an extensive military building programme was undertaken to build new forts and refurbish older ones. A fortified route was constructed, the *Strata Diocletiana*, to protect southern Syria.

During the fourth and fifth centuries the military system expanded, as there existed "a broad fortified outer zone in Transjordan from Bostra to Aila and a secondary zone of defense in southern Palestine from the Mediterranean to the Dead Sea.... This zone was designed to contain attacks of the Hejaz tribes and control movement through the Wadi Sirhan" (Parker 1986a, 145).

During the later fifth century the frontier defences were gradually abandoned in response to problems in the north, and tribal confederations gradually took over power in the frontier areas. By the middle of the sixth century forts in central and southern Jordan had been abandoned and the area was not reoccupied by Roman forces after Heraclius' restoration of power in AD 631.

Parker's model is based on a number of assumptions. First, it presupposes that the study of the *limes* is the study of the frontier and *vice versa*. Second, it also situates forts as the

central aspect of this frontier system and relegates roads as subsidiary features that served only to link military locations. Third, it supposes that defence is the primary function of the military locations found on the Arabian frontier. Finally, although it refers to the original province of *Arabia* (AD 106 – 295/297), it is clear that Parker views the geo-environmental divide between the desert and the upland Jordanian Plateau as the area where the frontier, and thus military presence, was located.

Most importantly, he also holds that the Arabian *limes* is an example of an empire-wide Roman strategy to control frontiers that had developed as part of the early Principate policy to limit territorial expansion (Parker 1986a, 1). He notes that many of the imperial campaigns of the first century AD, such as the Flavian dynasty's push into the upper Rhine and Danube area, were attempts to simplify and improve military frontier lines. On the Eastern Frontier, the campaigns by Severus to invade Northern Mesopotamia can be seen in this light, as Severus attempted to develop the Jabal Sinjar as a defensive line. Although, in the north-eastern areas of the Eastern frontier the Romans faced the Parthians and then the Sassanians, this was not the case on the Arabian frontier. Here Parker maintained that the frontier developed to monitor and control nomadic incursions (Parker 1986a, 8). Nevertheless, he pointed out that it was not designed as a barrier but as a zone of integrated forts and towers that could co-ordinate patrols and counter-attacks (*ibid.* 9).

However, in both Parker's 1976 article and his 1986 book, he does not argue why fort location should demonstrate a centralised political ideology or strategy. Moreover, he does not provide a wider archaeological or historical context to situate the view that fort location is a direct correlation of central political control. Clearly, Parker regarded this as such an obvious assumption that it did not warrant demonstration. This common-sense assumption may carry more weight in a discussion of military deployments during a period of war, but, in an analysis of a 500-year period of provincial rule that is marked by an absence of large-scale warfare, it requires a more sustained and detailed exposition. In subsequent articles he noted, somewhat programmatically, that his model is "based on the assumption that long-term military deployments reflect rational decisions by Roman authorities based on perceived security concerns and available logistical resources" (Parker 1997a, 115). This is an assumption that clearly views fort location as an expression of military function only. Furthermore, it restricts the view of a fort in the landscape as a consumer of local resources.

Parker's (1986a, 115–122) discussion of the pre-Roman Nabataean defensive system also suffered from a limited scope and direction. Parker's treatment of this is essentially historical as the archaeological evidence, at that time, for Nabataean military structures and strategic

concerns was meagre. In fact, even now there has been little archaeological research into the Nabataean politico-military structure. Graf (1994) and Bowsher (1986, 1989) have made some serious contributions on the structure of the Nabataean army and its integration into the Roman army following annexation, but using historical evidence only. Nevertheless, in his discussion, Parker, using data mainly from archaeological surveys, noted that the Nabataeans constructed a network of small posts to police and monitor their trade (Parker 1986a, 115–118). In his view, these posts formed the framework of the Roman military system when they took power. However, he noted a clear regression in some areas, which was also confirmed by Graf's survey of tower sites in the Hisma. Graf showed how many sites that were occupied in the Nabataean period did not have a Roman occupation (Graf 1979).

If Parker wished to show that Nabataean strategic concerns were carried on into the Roman period, he would have to show more evidence of political, economic and military structural continuity. Evidence clearly exists, such as the legal documents of Babatha (Cotton 1993, 1997, 1999) which show certain continuous legal practices, but Parker should have shown this as a precursor to his observations in the discussion. Furthermore, in his discussion of Nabataean military posts he completely ignored the tense relationship between the Nabataean Kingdom and the Jewish Kingdoms of the Hasmoneans and the later Herodians (see Shatzman 1983 & 1991, 98–169, 277–309). This, more than policing trade routes, would have necessitated relatively large-scale strategic deployments of troops and systems of defence.

However, at a broader level, his treatment seems to confuse two linked but different research trajectories. If Parker wished to demonstrate the creation and development of a Roman *limes*, it is unclear why he should choose to focus on Nabataean defensive systems but not adequately discuss Roman military systems in the Syrian and Negev areas prior to the annexation of Nabataea. Similarly, a discussion of the Nabataean defensive system and the successive Roman system of defence makes sense only in the framework of a Jordanian archaeological analysis or a wider historical treatment of military systems within modern Jordan. But Parker does not explicitly attempt such a comparative analysis (although modern analogues are sometimes briefly introduced *e.g.* Parker 1986a, 129), as his aim is to trace the development of a supposedly unique Roman defensive system. In this regard he has confused the demands of archaeological and historical methodologies. His geographical (and thus a primary appreciation of archaeological material) scope has been limited by the extent to which he could carry out archaeological fieldwork. However, the historical questions that he set himself demanded a broader geographical and chronological scope.

## Critical review of Parker's model

As will be outlined below, many Classical historians and archaeologists have challenged the ability of archaeological research to reconstruct imperial policy. In this regard Parker's weak methodological framework has not helped. His lack of an overt methodological statement outlining the processes in the identification and analysis of fort location has undermined his archaeological dataset. As will be shown below, it has allowed many scholars to deny his conclusions by questioning the basis of his evidence.

The next section will outline the response to Parker's work in Jordan. The discussion is grouped thematically and will deal first with the methodological issues raised by Parker's work and the reactions to it. It will critically review six areas of Parker's model that have been most debated by scholars in the region: use of the term *limes*; the so-called nomadic menace; Parker's limited dataset; use of surface survey site plans; tracking ancient road systems and the ceramic framework for Parker's surface survey ceramic samples. The latter part of the discussion outlines alternative views of the basis for Roman military action in southern Jordan. This discussion will compare and contrast these alternative views with Parker's by critically evaluating the dataset for each view.

### Use of the term *limes*

As was noted above, Brünnow & von Domaszewski (1905) believed they had uncovered substantial evidence of two sets of *limes* that seemed to confirm Ammianus Marcellinus' description of the Syrian frontier as *interiores limites* (Amm. Marc. 23.5.2). For the Romans, the term *limes* originally meant a transverse line (Whittaker 1994, 18–20) which was then used by surveyors to mean the outline of territory (*ibid.* 26–28). In the Early Principate the word mutated to mean a military road following a border. Mommsen apparently first used the word *limes* to denote a system of military or political frontiers in the Empire (Mommsen 1908 quoted in Isaac 1998, 345). These archaeological remains of forts linked by roads were soon seen as the framework of military systems (*e.g.* Alt 1935).

Parker did not analyse the use of the word *limes* even as it pertained to usage in the Arabian province. He accepted the discussion of Fabricius (1926, 572–671, cited by Parker 1986a, 1), following the interpretation of Mommsen, that *limes* meant a closed border (Fabricius 1926, 572–4) but curiously later on noted that Bowersock was "right in assuming that the term...came to mean a broad fortified zone, not a single fortified line" (Bowersock 1976, 227–8, quoted in Parker 1986a, 6). He does not attempt to analyse these two quite different meanings. Parker termed his Limes Arabicus Project after the late Byzantine writer Rufinus

(Rufinus *HE* 2.6) who used the term to describe the frontier of Arabia – *Palaestini et Arabici limitis oppida atque urbes.*

The use of this project name was criticised by Bowersock as a possible dangerous anachronistic use of an ancient word (Bowersock 1983, 103 note 39). In his 1971 article Bowersock followed the use by Brünnow & von Domaszewski (1905) and summarised the military remains of the eastern frontier using this term. However, he corrected this in a later article (Bowersock 1976) where he pointed out that it probably referred to a zone rather than a fortified line. He questioned Brünnow & von Domaszewski's interpretation of Ammianus' description and suggested that *exterior limites* meant the desert areas and not a fortified line. However, Bowersock's argument that it could not refer to an inner and outer road, while correct to point out that no source ever referred to the *via nova Traiana* as an interior *limes*, was wrong to emphasise that there was no evidence for an outer desert road (Bowersock 1976, 221–222). Isaac was correct to note that the line of milestones found by Brünnow & von Domaszewski, and noted by Thomsen (1917, Tafel 1) in his map of the roads of the area, clearly denotes an outer road (Isaac 1992, 128).

However, in an important article, Isaac (1998, 345–387) traced the use of the word *limes* from the early Principate to the Late Byzantine period and concluded that it did not indicate a formal military system (*ibid.* 353). He concluded that the word was never used in conjunction with fort construction or lines of forts. Indeed, in the first three centuries AD it was intended to mean a frontier, based on its original use as a word for a road between Roman and enemy territory. After the third century it was purely an administrative term for military forces organised within provincial boundaries. Therefore, he concluded that Mommsen and others, such as Brünnow & von Domaszewski and Parker, used the word anachronistically (*ibid.* 380) which casts doubt on the existence of the very system itself.

Mayerson (1986c & 1989), in his discussion of the term, comes to agree with Isaac. He sees no formal use of the term to denote a military system but he did not discuss adequately the later use of the term to denote a military organisation of frontier provinces under a *dux*. The later use of this as a frontier province meant that the term was used by ancient non-military writers, such as Malalas or Rufinus, in a more loosely termed word for frontier or zone.

However, Wheeler (1993a, 27–30) rebutted the Isaac's arguments and insisted that the term *limes* was associated with the construction of forts. While acknowledging that Isaac was correct to note that the term *limes* was not directly linked to fort construction in ancient texts or inscriptions, the term certainly occurred in the same sentence as the description of military

frontiers (*ibid.* 28). As Whittaker noted (Whittaker 1996, 28), there are still differing definitions of what frontier meant in the ancient world and the precise terms of the use of *limes*.

Even if Isaac is correct to note that the term *limes* really refers to a fortified road that changed from the fourth century onwards into a frontier district under the command of a military officer, the name still carries a military connotation. In his major work *The Limits of Empire* (Isaac 1992, 408–411), Isaac contends that his review of the evidence demonstrates that the term *limes* cannot be applied to a fortified frontier. He terms the later Byzantine use of the word as having an "exclusively administrative content" (Isaac 1998, 359). His distinction is exact but slightly misleading. The term still refers to the administration of a military organisation that only existed in the frontier provinces. Further, the army of these provinces was deployed in forts around the province. Thus the connection between fort location and use of the term *limes* continues in the later Roman period if not as directly as previously thought.

## The "nomadic menace"

It is axiomatic that a frontier system must be in response to a perceived threat. Parker (1986a, 1995) has long held that the movement of tribal groups, the so-called "nomadic menace" (Graf 1997a, 123), constituted the sole threat over the 500-year period of Roman rule. This view has been frequently debated and criticised by many scholars. Luttwak (1979, 78–79) classed these nomadic movements as low intensity threats from nomadic tribes, which were countered by mobile patrols, efficient roads systems and the garrisoning of major watering holes. He had based this view on Gichon's archaeological work in the Negev (Gichon 1971). Gichon's work contrasted Iron Age and Roman defence systems in an attempt to show that the same strategic concerns of the Romans were shared by earlier Jewish kingdoms in resisting Arab nomadic aggression (Gihon 1967). However, scholars such as Mann, while preferring to see the frontier systems as conditioned by the defence of trade routes, still viewed the primary threat to these routes as nomadic tribes. Using some rather stock imagery of the Middle East, he noted that these routes "inevitably attracted the attention of Bedouin" (Mann 1974, 524).

While there is clear ancient evidence of military actions by essentially tribal groups, such as the massive revolt by Mavia in AD 378 (Shahid 1984a, 1989), the real debate has been whether this was a constant pressure over 500 years as Parker would argue. Millar has noted, in his cultural history of the Roman East, that it was only in the third and fourth centuries

that settled peoples began to see nomads as a distinctly different people who could pose a threat (Millar 1993, 435). Moreover, he places the campaign against the Saracens by Diocletian in AD 290 in Syria as the first instance of a strategic threat against the frontier. Parker also used this as an example of the threat that necessitated the building of the frontier system in Arabia (Parker 1986a, 136; 1992). However, Graf (1997a, 123–124) has shown that the "campaign", as it pertained to *Arabia*, may have simply been referring to a large working party for the construction of roads (*cf.* Kennedy and MacAdam 1985, 100–104). In fact, in a series of articles Graf has consistently attacked the view that nomadic pressure was a dominant factor in the military arrangements of this area (Graf 1978, 1997a, 1997b).

However, Graf overstates his criticism of the importance of the role of nomads in military affairs. He used the observations of Ammianus Marcellinus who, as a fourth century soldier, has been presumed to offer direct military experience of the frontier (as Parker 1986a, 5), to show that most textual evidence is characterised by literary conventions. Marcellinus frequently referred to nomads as "*Saraceni*" in disparaging tones and consistently emphasised their aggression (Amm. Marc. 14.4.1–7). Graf holds that this is mere Classical convention (Graf 1978, 14; 1997a, 124).

Moreover, Graf uses archaeological evidence of Safaitic and Thamudic inscriptions on rocks in the basalt desert areas of northern Jordan and southern Syria to show that the nomadic pressure came from within the Roman areas (Graf 1978, 1989, 1992). He noted that these inscriptions, which were mainly made in the Nabataean and Roman periods, came from areas that were within the Nabataean and later Roman settled areas (Graf 1989, 368). As Graf (*ibid.* 367) correctly equates these inscriptions with a nomadic population, he concludes that the threat was integral to the Empire. If one accepts nomadic movements as a major threat, the pattern of military distribution must be seen as an internal policing system. This led Graf to characterise the whole military system in Arabia as one primarily directed against internal revolt, brigandage etc. (Graf 1989, 400). This view of the military system will be discussed in the section below. However, one should note that Parker also used the existence of these inscriptions to argue that the *limes* system was built to defend against external, aggressive nomadic forces (Parker 1986a, 1995).

However, in a wide-ranging and incisive review of the presence and nature of nomads in the late Hellenistic and Roman periods, Macdonald finds that Graf's and Parker's criticisms are unfounded and based on a misreading and misunderstanding of epigraphists' works (Macdonald 1993, 323–4, 336). Macdonald, who has carried out primary fieldwork on the Thamudic and Safaitic inscriptions, mainly from the Hawran area in Syria, refuted Graf's

view of the occurrence of these inscriptions as being within Roman territory, as a partial misreading of certain key texts and a consequent over-interpretation of the evidence (*ibid.* 342). Indeed he concludes that "nothing in these inscriptions suggests that their authors posed any threat either to...the Romans [and] the vast majority...were largely indifferent to the imperium" (*ibid.* 346).

Curiously, in a review of this topic, Graf (1997a, 124) quotes Macdonald's 1993 paper as a further indictment of Parker's approach but which also supports Graf's view that there was no nomadic threat. Further, he linked Parker's approach to an even wider bias in western scholars where they (unconsciously?) use nineteenth-century images of the Orient and transport this into the past. Referring to Said's work *Orientalism* (Said 1995), Graf points out that many of Parker's views regarding nomads on the frontier are in fact derived from more modern periods. While this is certainly true, Graf had clearly not noted Macdonald's critique of his own work that pointed out that Graf's own anthropological assumptions were flawed (Macdonald 1993, 338–339).

In fact, as was repeatedly emphasised by Macdonald (1991, 1993), many of the terms and definitions, and indeed some of the underlying models of thought, in this debate are unclear and illogical. At the heart of this problem is the poor understanding of how to treat data from other disciplines. Specifically, there are frequent attempts to use mainly nineteenth-century analogies, concerning the relationship between settled peoples and the Bedouin in the Levant as a model for the interaction of nomads with the Roman imperial system. Parker's approach, to compare the aggression of pre-Islamic poetry, glorifying raids, with examples of modern Bedouin raiding (Parker 1986a, 8, 1990, 469) to demonstrate that nomads are inherently aggressive, has been criticised by Macdonald as "superficial" (Macdonald 1993, 327).

While Parker was content to provide analogies to further his case for nomadic threats, he was critical of other scholars' attempts to use analogous data to prove otherwise. Banning, a prehistoric archaeologist, using survey data from the Wadi Hasa Survey, attempted to show that, far from a hostile relationship, there was evidence of strong co-operation between settled and nomadic peoples in the Roman period (Banning 1986). Using carefully worked out analogous data from anthropological studies by Barth (1956) of the Swat tribes in Pakistan, Banning constructed a series of alternative hypotheses of settled/nomad interactions with appropriate tests using archaeological data (Banning 1986, 29–31). He concluded that the survey data seemed to suggest a degree of symbiosis or mutualism

between agriculturists and nomads. Thus, it was unwise to postulate a constant nomadic pressure against the settled areas.

Parker responded to this analysis by noting that Banning ignored substantial historical evidence of a hostile relationship (Parker 1987b). However, as Banning made clear in his response (Banning 1987), Parker ignores the potential for bias in historical sources. In a later paper, Mayerson attempted to meld both viewpoints by suggesting they were parts of the same whole, as superficial hostility by nomads could co-exist with a longer term pattern of subsistence (Mayerson 1989). However, while Mayerson averred that only textual evidence could substantiate the argument (*ibid.* 72), it is clear that Parker and Mayerson did not understand the method (and thus the strength) of the structural analysis that Banning undertook. While Banning's argument is weak in places, the basis for his analogies and the rigorous use of the archaeological data is robust compared with Parker's approach.

Unfairly termed "fruitless" by Whittaker (1994,118), the debate centred on the degree of "mutualism" between settled and nomadic groups. Banning set out to prove, using survey data, that both nomadic groups and settled communities in the Roman period co-existed, showing no signs of a hostile relationship. As Parker (1986a, 1995) always maintained that nomads were the strategic concern that led to the creation and maintenance of the *limes* system, Banning's results would constitute a severe blow to his hypothesis.

It is argued here that Parker's and Banning's views were framed within a colonialist core-periphery model using exclusive group identity models. Banning, while framing the interaction as mutual (Banning 1986, 29–31), sees the nomadic groups (gained from survey data from the Wadi Hasa survey, see MacDonald 1988) as equated with the Saracens of the historical record. The only basis for this is that the material remains are viewed as evidence of nomadic lifestyles. This, as Banning admits, really only demonstrates a subsistence lifestyle, from which it is difficult to infer an identity model (Banning 1986, 30). However, the equation with an historical entity is assumed to allow comparison with wider debates on Roman frontier interactions.

Both Parker and Banning implicitly agree that nomads are external to Roman settled areas and a curious paradox emerges. The relationship between the material remains of nomadic groups and established settlements that are seen by Banning as mutual but distinct, and the Saracens that Parker views as hostile entities against which the Romans built forts etc., must be the same groups that formed the Arab federation and Ghassanid Phylarchies in the later Byzantine period (Shahid 1989). The emergence and development of this feature is poorly understood in the archaeological record of southern Jordan.

Despite Parker's constant assertion that there was always nomadic hostility, there is little evidence from the early Roman period to support this view. However, Graf's assertion, noted above, that later Roman writers like Ammianus Marcellinus exploited the image of a hostile nomadic presence, cannot be maintained. As Shahid (1984a, 1984b, 1989) has shown in his series of works on the Arabs throughout the history of the Eastern provinces, the Romans used nomadic forces with increasing frequency in the wars against the Persians and to maintain stability on the frontiers. As these nomadic peoples gained in military prowess/strength and political importance, it cannot be coincidental that there are more references, usually hostile, to these Saracens (O'Connor 1986). As Whittaker notes, "it is difficult to deny that they represented a growing force" (Whittaker 1994, 245–246). However, with the gradual take-over of imperial administration by local tribal leaders it is increasingly difficult to speak of a distinct nomadic threat. The large tribal confederations, that clearly worried settled contemporaries, were obviously a product of imperial confrontation. For all the fury and heat of this extensive debate, a balanced picture of nomadic interactions has not yet been produced (Millar 1993, 435).

### Limited dataset and survey universe

In his 1986 work, Parker consciously placed his research in a historical context whereby he attempted to outline and analyse the development of the *limes* on the Arabian frontier within the major political/military events of the Empire. However, in his 1987 publication, *The Roman Frontier in Central Jordan*, he described the Limes Arabicus Project as a limited test (Parker 1987a, 3–5) of the overall conclusions reached in his doctoral research. While this project was essentially an archaeological project, his 1986 work has been criticised for its very limited historical and archaeological framework.

However, it should be stressed that the data used in Parker's 1986 work was based completely on his 1976 rapid survey of sites. This much is evident when comparing the numbers of pottery samples obtained from the 41 sites in 1976 (Parker 1976, 23–25) with those of the 1986 work (Parker 1986a, 178–179). For both studies, Parker carried out no fieldwork to locate new sites but instead sampled previously known sites. In his 1986 work, in the discussion of the southern sector (*ibid.* 87–114), he did include some new sites from recent projects. Of the 15 sites identified south of the Wadi Hasa (Nos. 27–41 in the tables of both publications), Parker added Rujm Faridiyyeh, found by MacDonald in his Wadi Hasa Survey (MacDonald 1988), and Humayma which had been surveyed by Graf and Eadie in 1983 (Eadie 1984). These sites were discussed in the main section but he only referred to

two major sites in passing in the introduction – Ruweihi (Parker 1986a, 89) and Umm Ubtulah (*ibid.* 89) – which had both been found by MacDonald.

Kennedy, in his review of Parker's 1986 and 1987 works, notes that Parker did not specify the geographical extent of his work (Kennedy 1992, 477). While, it is obvious that it is clearly more concerned with Roman Jordan, this seriously weakens Parker's methodological structure. Parker does not fully discuss material from Syria, Palestine or Saudi Arabia. Moreover, as Fiema (1995) noted for Jordan, Parker does not even discuss known military sites behind his supposed frontier in the Wadi Arabah. Although he locates some sites in a map of forts in the fourth century (Figure 6, page 320), in a discussion of the frontier after Diocletian, he does not refer to them in the text. These sites – Safi, Feifa, Et Tlah, Bir Madhkur, Gharandal – are well known from the surveys of Alt (1935), Frank (1934) and Glueck (1934) in the 1930s. Also, more recent work by Rothenberg (1971) on the Israeli side of the Wadi Arabah had added to this dataset.

As Kennedy rightly noted, the complete lack of any discussion of these sites is a "largely ... deliberate exclusion[s] determined by his [Parker] view of the frontier" (Kennedy 1992, 478). However, Parker did not demonstrate why his corridor of sites should be different from the rest of the military sites noted in the province of Arabia. This should have been predicated on a discussion and comparison of all military sites in the area. This does not necessarily mean that Parker's view of his *limes* sites is inherently wrong, but it does seriously call into question his selection of sites for archaeological analysis. In later discussions he never addresses these important concerns but merely reaffirms his earlier conclusions (*e.g* Parker 1997a).

### Failure to account for site plan

The collection of ceramic data from over 40 military sites allowed Parker to construct a historical sequence that correlated ceramic presence with site interpretation derived from surface plans. The response to Parker's ceramic methodology and results are presented in the next section. However, Parker assumed that all his sites were demonstrably military ones. His assumptions were derived from a number of sources: literary, inscriptional and architectural. Of these, the first two sources can only provide a patchy idea of the overall military pattern. Most literary sources, such as the *Notita Dignitatum* (Seeck 1876) or the Beer Sheva Edict (Alt 1921) of which both deal with purely military sites, are inhibited by the lack of knowledge of ancient names. Military inscriptions, unless clearly built into the fabric of the building under analysis, are difficult to interpret when the archaeological

context is not clear (*e.g.* Uweinid – Kennedy 2000, 59–61). Further, there are hardly any inscriptions found in military sites in the south of Jordan (Kennedy 2000, 22–24). This means that architectural plans of sites usually form the basis of a military interpretation in this area.

In both his 1986 and 1987 works Parker does not specify the archaeological criteria for establishing a military interpretation from the surface architectural plan. Of course, the standard Roman "playing card" type is an extremely diagnostic type (Lander 1984) and most heavily built rectangular structures with towers can always be assumed to be forts. However, the interpretation of many sites in his southern sector of Jordan (Parker 1986a, 89–112; see Figure 6, page 320) as military is open to doubt. Of the 14 sites discussed in this section, five – Rujm Faridiyyah, Jurf Ed Darwish, Qasr el Bint, El Hammam, Al Mutrab – do not have towers and one other is a tower only (Rujm Es Sadaqa). Several of the sites such as El Hammam and Al Mutrab correspond to a *caravanserai* type design where there is a large central courtyard with rooms on every side. This type is a common feature of Middle Eastern architecture in the Classical and Islamic periods (Wright 1985). The remaining eight sites – Dajaniyah, Udhruh, Ail, Khirbat Qirnana, Humayma, Khirbat El Quweira, Khirbat Khalde, Khirbat Kithara – all have clear military features such as heavily built walls, playing-card design and corner and mid-wall towers.

In a later work Parker established a typology of military sites using diagnostic features such as the presence and location of towers, layout and size (Parker 1995). However, he did not usefully ground this in a wider examination of settlement hierarchy. Although he had carried out large-scale surveys of the area around Lejjun he did not correlate this data with the sites he termed forts (Parker 1987a). This lack of precision has been repeatedly criticised by many scholars. Gregory (1997 I, 79–99), in her wide ranging examination of Roman forts on the Eastern Frontier, showed how various types of structures encountered in the Middle East were termed forts with minimal interpretation. She (*ibid.* 94–99) emphasised that *caravanserais* (or khans), villas or farms, monasteries and single towers can be mistaken for military remains; although in some cases they did function in that role. She showed that earlier surveyors, carried away by the "square-ness", attributed a Roman military role to many sites. This argument followed the line "if a structure was Roman it had to be square" and "if a structure was square it had to be Roman" (Gregory 1997 I, 20–21). However, while Gregory provided many anecdotal critiques of this "method", she failed to observe that it is a fault of surveyors who do not have a full grasp of the entire range of settlement types

encountered in the landscape. She therefore displays the somewhat myopic view of Limes Congress scholars who do not see forts as part of the wider landscape.

Kennedy, in his corpus of Roman military sites in Jordan compiled for the Roman Frontier Congress XVIII (Kennedy 2000) and in his 1990 collaboration with Riley on aerial photography of Roman military sites in the Middle East (Kennedy & Riley 1990), follows in this same tradition. While he is critical of Parker's methodology for the identification of sites (Kennedy 1992, 478–480), his own work, while establishing a typology of sorts, still suffers from the same weak methodological process as Parker's. In neither work does Kennedy provide a securely local contextualised archaeological framework to situate his types or criteria for military identification.

However, this weakness is not restricted to scholars who have a positive view of the interpretation of military structures in the landscape. Isaac (1992), in his wide-ranging critical analysis of the strategy and designs of the Roman military in the Middle East, is highly critical of archaeologists who assign a military value to any heavily built structure in the frontier area (Isaac 1992, 198–208). His work has gone a long way to provoke a revision of the *limes* view of the frontier evoked by Luttwak and Parker. Potter (1990), in his review of Isaac's work, while disagreeing with Isaac's overall interpretation, noted that "the best part of this analysis...is Isaac's study of Roman military installations in Judaea" (*ibid.* 5). In a manner similar to Gregory, Isaac questions the interpretation of most buildings as forts and provides an anecdotal compilation of instances where fort-like structures are actually road stations (Isaac 1992, 205), agricultural towers (*ibid.* 185–186) or religious buildings (*ibid.* 207). While certain aspects of his revision, at a historical level, are indeed valid, Isaac does not discuss the wider archaeological context of his observations. This means that, like Parker's limitations noted above, Isaac's treatment of the archaeological data lacks a secure methodological base.

### Failure to account for road systems

The term *limes* in the Early Principate was given to associate forts with a road system in enemy territory (Isaac 1998, 347). However, although this meaning did not survive into the Byzantine period (*ibid.* 353), as the initial surveys of Brünnow & von Domaszewski (1905) amply demonstrated, the direct physical association between forts and roads is very clear. This was confirmed by Thomsen's (1917) catalogue of milestones that clearly showed, in southern Jordan, the *via nova Traiana* and a small branch road to the east. The discovery of actual roads, more than forts, served to prove the presence of a definable *limes* for Brünnow

& von Domaszewski and later scholars. The connection between roads and military structures in the Roman world is so strong that to determine a system of forts without demonstrating the road system is, as Isaac called it, an "unstructured procedure" (Isaac 1992, 128).

Therefore, it is curious that Parker attempted no survey of the road system that linked the forts in his study. Why he thought that a review of the location, plan and ceramic dates from many sites first investigated by Brünnow & von Domaszewski was necessary but did not apply this review to the delineation of road systems is never fully explained. It should be remembered that it was only in the later 1980s and 1990s that the true outline of the *via nova Traiana* and some branch roads was fully understood (Graf 1995; MacDonald 1988, 1996; Fiema 1993).

In fact, Parker erroneously marked the *via nova Traiana* as passing Udhruh which consequently by-passes Petra. Although, at the time, there was some confusion as to the exact route of the *via nova Traiana* in this area (Graf 1995), it is clear that the milestones regarded Petra as its *caput viae* (Thomsen 1917, Nos. 71, 87a & 90). Bowersock, in his *Roman Arabia*, clearly locates the *via nova Traiana* as passing through Petra (Bowersock 1983, see his map on page 93). By locating the *via nova Traiana* through a major fort such as Udhruh, it seemed to Parker to confirm that the road was designed solely as a military route. The evidence for a road through Udhruh rested solely on the existence of milestones discovered to the north of the town in fields (Killick 1986, 1987) or else at the entrance to a road leading to a Muslim site called the "Hill of Arbitration" which was clearly out of context. In fact there is no evidence for a paved road to the north of Udhruh, although it is clearly marked on many modern academic maps (Tsafrir *et al* 1994, Roll 2000; Figure 59, page 380).

Graf's 1995 detailed study of the *via nova Traiana* south of Petra has added immeasurably to our knowledge of the route as it leads to towards *Aila* (modern Aqaba). North of Petra, Fiema's survey (Fiema 1993) has noted the road from At Tuwanah to the site of Rujm El Faridiyyah (MacDonald 1988, 226–228). From this point MacDonald's 1988 survey tracked the road as it entered the Wadi Hasa (MacDonald 1996). The only area not covered was the route north of Petra as far as At Tuwanah. Although Glueck (1934) had noted the road briefly in the 1930s (as well as recording most of the milestones), the actual route was unknown until the DAS project recorded it (see Chapter 6). Thus Parker's failure neither to review earlier surveyors' reports nor to carry out a preliminary fieldwork survey is another weak point in his survey methods and coverage.

## Ceramic frameworks

Underpinning the historical basis of Parker's Limes Arabicus model is the validity of the ceramic sequence used to phase the forts. Graf (1991) has questioned Parker's ability to identify Nabataean and Early Roman ceramics. However, the basis for Graf's observations was Alt's report on Nabataean ceramics at Khirbat Khalde in the 1930s (Alt 1936). In Parker's subsequent survey he presented no such ceramics (Parker 1986a, 179). To Graf this suggested that Parker was unable to identify such ceramics correctly. However, the dynamic nature of surface artefacts is such that no two samples are similar. Graf's observation, ironically, highlights his own inexperienced view of surface survey sampling and its problems, rather than proving Parker's poor grasp of ceramics.

Kennedy's (1992, 480–2) review of the ceramic dating methods Parker used for his survey and excavation also displays a lack of awareness of the problems of surface survey samples. What is not at issue here is the validity of the Hesban ceramic sequence developed by Sauer (1973) and used by Parker (1986a, 163–179) in his various projects. What is of relevance here is the explanation behind the presence of ceramics on a site. Kennedy, in reviewing the ceramic framework behind Parker's dating of sites, lists three "powerful caveats" to warn of the dangers of using ceramic data. "First, the presence of sherds of any period on a military site need not imply full military occupation, or even necessarily that the owner was a soldier. Second, with a modest sample ranging over several consecutive periods it is perfectly possible that the site was occupied intermittently rather than 'continuously' (to employ Parker's own term). Third, sites apparently 'contemporary' on the basis of surface sherds need not be when even the sub-periods are about 40 years long" (Kennedy 1992, 481–2).

Kennedy's caveats only partially explain the difficulty of using surface survey ceramics. In frontier studies in the Near East, it is the surface site plan that determines the interpretation of military remains and the ceramics are only used to suggest site phasing. Further, Kennedy's second and third points are issues pertaining to surface surveys in general rather than Parker's specific project. Kennedy's remarks are indicative of many Classical historians/archaeologists when discussing this ceramic question. Freeman makes a similar observation when discussing the presence of ceramics at the large military site of Dajaniyah (Freeman 1990 & 2001, 446). The correlation of surface ceramic data with site function is a poorly understood part of the archaeological process, as many scholars treat the surface data as corrupt and the buried "stratified" data as closer to the original dynamic (see Sullivan 1998).

Many scholars who question Parker's ceramic identifications do not sufficiently value the strength of those employing a stratified sequence. Although there are problems with the application of the Hesban sequence (Sauer 1973) in southern Jordan, it clearly established a useful framework. Parker (1987a) tested this in excavations at Lejjun that broadly confirmed the strength of the sequence. Most critics ignore the strong methodological basis for his ceramic identifications. There is, however, considerable regional variation in the pottery of most periods in Jordan, with the published assemblages from northern Jordan not being entirely applicable in the south (Bienkowski & Adams 1999; Walmsley & Grey 2001). However, recent work at Petra, from closely controlled excavations, is providing closer checks on the ceramic chronology of the area (Bignasca *et al* 1996; Stucky *et al* 1994), but it should involve a reinterpretation of earlier projects, not a complete denial of the validity of Parker's ceramic identification.

## Two opposing models

While for the most part scholars have been content to criticise Parker's model there have been few attempts to provide rigorously thought-out alternative models. The next section will describe and critically evaluate two models that have been put forward to interpret military variation.

### The internal security model

As was noted above, Graf, in dismissing Parker's nomadic threat argument, reasoned that internal security was the rationale behind most of the locations of military sites. However, in this case, as Graf had mainly based his view on the correlation of certain inscriptions and the nature of nomadic tribes, Macdonald (1993) rightly dismissed this. This does not mean that the army did not engage in internal policing roles, which are well known from many parts of the Empire (Hopwood 1989). The real question addressed in this study is whether the location of forts was designed to control internal security at a provincial level.

Fiema, in an archaeological review of the military structures of southern Jordan, pointed out that Parker had failed to consider many other military sites to the west of the *via nova Traiana* (Fiema 1995). Drawing on his PhD work (Fiema 1991), Fiema attempted to demonstrate that the overall fluctuation of military sites, observed mainly through surface ceramic horizons, did not quite match the scheme proposed by Parker. In particular, Fiema questioned the Tetrarchic build up from Diocletian onwards as a product of insecure dating criteria (Fiema 1995, 267). Fiema correlated fort use against the overall settlement patterns and concluded a certain relationship with periods of high and low settlement. He linked this

to an imperial system attuned to the demands of long-distance trade. This economic aspect of fort location will be discussed below but it is of note that Fiema directly linked fort location to internal security.

However, the most thorough discussion of the argument that fort location was determined by internal security was put forward by Isaac. In his main work, *The Limits of Empire*, although clearly assigning an aggressive role to Roman military actions, Isaac does not regard the Arabian frontier as a strategic entity to repel an external enemy (Isaac 1992, 158–160). Using mainly historical evidence, Isaac shows how revolts in Judaea constituted a major military threat that occasioned the posting of troops throughout the province (*ibid.* 68–99). However, even Isaac admits that the nationalistic nature of the Jewish resistance towards the Romans is not "indicative of the state of affairs of other provinces" (*ibid.* 77). It is clear that most rebellions took place soon after incorporation into a province (Dyson 1975), but whether this meant that the Romans designed long-term fortification systems to deal with this has not been shown as a common policy. It is also clear that the Romans did not engage in a long-term policy of disarming provinces they had conquered, in contrast to nineteenth/twentieth-century colonial powers (Brunt 1975). Nevertheless, Isaac also demonstrates that banditry was a common problem in all provinces and was on a scale to worry the authorities. Building on earlier work he uses diverse historical sources, including many detailed references in the Talmud to such things, to assess the large scale and nature of the problem. However, Parker, in his review of Isaac's book, pointed out that some examples of Isaac's banditry are actually well-attested nomadic raids (Parker 1992, 470).

Isaac then uses archaeological evidence to show that forts were sited to deal with this type of behaviour and not because of greater military threats (Isaac 1992, 104–134). Isaac is highly critical of the tendency of archaeologists to interpret every large rectangular site as a fort (*ibid.* 204). In fact, Isaac is highly sceptical about the extent to which archaeological studies can even contribute towards the debate on Roman frontiers (*ibid.* 6–7, 133, 156–157). However, Isaac's knowledge of archaeological theory and methodology seems rather unclear. His statement that "archaeology is particularly difficult because so much induction is involved in the interpretation of material remains" (*ibid.* 6), sets the tone for his treatment of archaeological data. Isaac attempts to show that most forts were badly sited for defence (*ibid.* 186–198) and that their presence on major communication routes clearly indicates that their purpose was to maintain internal security. As he does not correlate fort location against a wider settlement pattern, one is left unsure as to what the true connection is. Parker correctly noted that, at least from the fourth-century evidence of the *Notitia Dignitatum*,

most units were actually posted away from major centres, not within them, which one would expect if internal security were the aim (Parker 1992, 470–471).

Part of the problem with Isaac's approach is that although he uses comparative data from modern periods to highlight similarities (or not) with his system of internal control, he fails to engage with wider socio-economic data from the Classical period. In much of his work, he makes frequent references to Ottoman (Isaac 1992, 113–115, 145–146, 183), Crusader (*ibid.* 198–199) or modern Israeli methods of control in Palestine. Moreover, he used terms anachronistically and interchangeably, such as Bedouin and Saracen, until the second edition of his work, when Isaac noted the error (Isaac 1992, 439). However, like Parker, Isaac's analogies are presented superficially and lack the integrity of closely worked out structural comparisons.

Isaac's argument that internal security was the prime concern of the Romans in Palestine was similar to Mayerson's, whose view was based on his extensive archaeological and historical knowledge of southern Palestine. Rejecting the traditional use of the word *limes* (Mayerson 1986c, 35) he argued, like Graf, that nomads were indeed the prime threat to the Roman province but that their actions should be viewed as internal matters (*ibid.* 36). Using American models of frontier societies (*e.g.* Turner 1893), Mayerson argued that "the entire province, thinly settled, submarginal in terms of rainfall and cultivable land, and lacking a fixed eastern boundary, should be considered a frontier province" (*ibid.* 43). Thus, he viewed the archaeological remains of forts within Palestine as a frontier force concerned with the security of the entire southern province. In a later article, Mayerson attempted to develop this theme using a comparative approach, contrasting the Iron Age situation in the Negev with the Classical period (Mayerson 1990). A similarity between the Iron Age Jewish Kingdoms in the Negev and the experience of the Romans had already been noted by Aharoni (1967). However, Mayerson, taking a similar approach to Whittaker (1994), attempted to demonstrate the concept of a frontier area that is defined more by environmental factors than political/military ones. It is here that many arguments tend to blur as each scholar defines the frontier boundary differently and thus the nature of the military response.

### Economic model

The second model to be examined in this chapter is the connection between the economic structure of the Empire and the existence of the *limes*. Many of the debates discussed above view the *limes* as an exclusively military system designed only to combat external threats (*e.g.* Parker 1986a). For others who argue that its role was to ensure greater internal security,

economic stability is considered to be a crucial element (*e.g.* Mann 1974). The economic argument behind these views was one of a common-sense assumption that an empire, which is usually intent on extracting as much monies from the provinces or by external trade, would seek to take care of trade routes (Eadie 1989; Isaac 1980; Sidebotham 1986a, 1986b, 1989). Such studies rarely elaborated on the actual structural details of the connection but usually viewed the economic aspect as a stimulus only (*e.g.* Parker 1986a, 2).

In particular, the debates surrounding the annexation of the province of Arabia by Trajan usually promoted some form of interest in securing trade routes (see Freeman 1996a). This debate is usually presented as a Roman policy aim of annexation for which there is little evidence. In fact, Millar has characterised this debate about motives as "fruitless" (Millar 1993, 93). While the annexation debate is rather extreme given the lack of evidence, many studies that casually promote an economic reason for Roman annexation or conquests (and thus establishment of a military system) ignore the fact that these decisions were primarily political. Mattern (1999, 123–161) has clearly shown that these decisions were made within an aristocratic framework of honour in which an assessment of loss or profit by annexation was a rudimentary and secondary consideration.

Most discussions of the relationship between the provincial economy and the Roman Army are largely concerned with the impact of the army on the total economy. Usually influenced by Hopkins' (1980) model of a core/periphery economy, many studies view the presence of army as a stimulus to the economy through the movement of taxation money etc. However, in his detailed study of the impact of the Roman Army in Syria, Pollard, although he noted Hopkins' work, did not cover the direct exploitation of provincial resources by the army or the impact of building work carried out by the army (Pollard 2000, 213–240). Nonetheless he concluded that the Roman Army in Syria had no "significant impact on the regional economy as a whole" (*ibid.* 250). Alston's analysis of the Roman Army in Egypt came to a similar, if more negative, conclusion, noting that "in the comparatively developed industries of the East, it would be very difficult to attribute any economic change in this period to the military" (Alston 1995, 115). However, Safrai's (1994, 339–349) wider examination of the regional economy of Palestine in the Roman period concluded, "the presence of the Roman Army had a great positive influence on the national economy" (*ibid.* 457).

However, the only detailed study to investigate any socio-economic aspect of the frontier system in Arabia, specifically in southern Jordan, was undertaken by Fiema in a PhD study (Fiema 1991). An overview of this research was not published until 1995 (*ibid.* 1995). Fiema's work is the only one in Jordan to use archaeological data, in a relatively rigorous

way, to attempt a structural analysis of the connection between the military system and the economic framework of the province. Fiema had already analysed earlier Nabataean and Palmyrene economic networks (Fiema 1996) and his subsequent work has done much to clarify the settlement patterns of southern Jordan in the Classical period (Fiema 2002b).

Fiema wished to analyse the nature of the collapse of the Byzantine system in the early seventh century and, in particular, why there was a complete absence of military sites at this time. He accepted Parker's scheme that most forts had gone out of use during the fifth century or earlier and therefore wished to explain why it had happened then. Fiema developed a systemic model for the military variation noted in the archaeological record of southern Jordan (Fiema 1991, 44–62). He built a model based around the central dynamic of long-distance trade in luxuries in the ancient world economy. Using systemic notions of functional linkage between the subsystems of a political/economic polity, he postulated a link between state infrastructure, the variability of this trade and the wider settlement pattern. He proposed that variations in this trade had a direct relationship with military variation. Therefore the location and distribution of military sites was directly related to the strength and nature of the economic situation, and thus military concerns were a secondary factor (*ibid.* 53). Moreover, the variation in the military system did not necessarily equate to periods of military strength or weakness but instead to a deliberate policy of variable investment in provinces of economic significance. (*ibid.* 54–56)

Although Fiema adopted a historical framework for his study, he used archaeological data, mainly from surface surveys, to test his hypothesis. As Fiema did not carry out primary fieldwork, he carried out a thorough review of the existing dataset. While he noted the many problems associated with the use of survey data and surface plans, this data was better suited to the reconstruction of spatial and temporal military and economic systems. The variability in site use was primarily observed through the presence or absence of chronologically diagnostic ceramics. He traced the relationship of settlement patterns to known military sites, which he displayed through a series of maps phased by historical periods (Figures 11–14 pages 325–328).

Fiema concluded that there was a direct relationship between economic and military systems. Therefore, he explained the complete absence of military forts to deal with the Islamic invasion as the result of a policy to limit military investment in an area that was now considered economically deficient (Fiema 1991, 244). He thus completely negated the nomadic threat or defence-in-depth models developed by Parker (Fiema 1995, 267). Further, Fiema explicitly aligned his studies with the work of Isaac (1980, 1992) and Graf (1978,

1991), maintaining that internal provincial processes determined military variability (Fiema 1992, 267).

Fiema's study represents the first explicit archaeological study of the *limes* in Jordan. By consciously using a model grounded in a theoretically informed hypothesis that is tested by explicit archaeological correlates, Fiema's results were methodologically stronger than previous explanations. However, the study suffered from a number of assumptions that call into question his overall interpretation. A critical weakness is that Fiema did not test his conclusions using primary data. He was thus dependent on earlier surveys that collected data mostly by prospection method (*e.g.* MacDonald 1988). Thus Fiema's historical phasing of the spatial results of this data, outlined in his series of maps, only reflect the prospection transects of the surveyor and not meaningful spatial settlement patterns.

However, the main weakness in Fiema's study was an incorrect use of the main systemic core/periphery model. Fiema over-correlated settlement patterns with military data in the belief that all economic and military linkages were subordinated to the dominance of long-distance trade. Thus any variation in military or settlement patterns could be explained by reference to historical or archaeological assumptions of such trade. He failed to produce a suitable explanation for the structural linkages behind changes in ceramic production (which were used to phase his settlements patterns) or settlement pattern and their relation to long-distance trade. As such, he ignored local cultural processes that could more satisfactorily explain local settlement patterns or ceramic phases.

Sinopoli (1995, 6) argues that most classifications of core/periphery models in imperial situations, miss the significant variability in most empires and can (sometimes unconsciously) homogenise the situation. Indeed core/periphery models, when used in imperial culture contact situations clearly predispose cultural processes to be discussed only at the core/Roman level. Consequently these models deny the balanced reconstruction of frontier societies.

Another problem is the nature of the initial observations that lead to Fiema's research questions, namely that military structures in southern Jordan declined in the later fifth and sixth centuries. This is mostly derived from Parker's (1976, 1986a) field survey work which showed such a decline based on the ceramic variability of his field samples (Figure 8, page 322). As was noted above, the robustness of Parker's ceramic chronology, based on Sauer's Hesban sequence, is questionable. Graf (1991) and Kennedy (1992) had already expressed concerns with this sequence. However, the problems with Late Byzantine to Early Islamic ceramics are well known, if unresolved. It should be noted that Fiema stills holds to a "low

chronology", based on his excavations of shops in Petra (Fiema 2001a, 2001b), that supposedly demonstrates a general decline in the seventh century (Fiema 2002a, 70). But recent work is beginning to show that Later Byzantine wares continue well into the Early Islamic period (*cf.* Walmsley & Grey 2001). This has clear implications for the majority of survey projects in southern Jordan, which Fiema used in his study, as it is likely that wares identified as Early Byzantine may in fact have a chronological span from the Early Byzantine to Early Islamic period. Thus the decline in sites may be a problem of ceramic identification rather than the result of an actual socio-economic process.

As with many of the explanations of *limes* discussed here, it is a moot point if a single explanation is sufficient to account for all the variability within the 500-year period of Roman rule. In Fiema's case, this may be partly because of the problem of applying systemic models that are difficult to correlate with historically contingent events. However, it is not clear if the concept of long-distance trade suitably explains the historical problems that Fiema set out to solve. In fact, the historical problem that Fiema set out to prove, namely the collapse of the military infrastructure in the early seventh century, can be reasonably understood in the light of shorter term historical events such as the Sassanid period occupation (*cf.* Kaegi 1992, 1996). Moreover, even if one accepts that there are clear structural reasons underpinning military variations, and while there is a correlation between military variation and settlement pattern, it does not follow that the effects of long-distance trade are the cause. Fiema's systemic model requires the input of a dynamic force, which he clearly sees as being the imperial authorities. Unfortunately, he does not explicitly demonstrate the structural linkages between the imperial government and the controls of trade.

In fact, there is considerable historical evidence to show that the Romans did not attempt to control long-distance trade beyond taxation and did not alter imperial policy to take account of the trade. Raschke (1978), in his study of the development of the Silk Route trade, had shown that it was really controlled and managed by middlemen. Furthermore, Young, in a study based on his PhD work, analysed the Roman segment of this trade and concluded that, in the first three centuries AD, "there is not one major policy initiative of the Roman government...which can be primarily attributed to the needs of this [long-distance] commerce." (Young 2001, 219). Moreover, in his discussion of the connection of the *Limes Arabicus* with trade (*ibid.* 128–134), Young noted that their function was similar to the Egyptian examples discussed above (Sidebotham 1986a.), which provided security for caravans etc. However, he denied a structural link between the two processes and went so far

as to assert "that there is no evidence that...Roman military activities in the area were ever occasioned by the incense trade" (Young 2001, 135). While Young brings a clear wealth of economic data to further this argument, he does not refer to Fiema's work, which is quite remiss. Nevertheless, there is sufficient doubt as to the validity of Fiema's explanatory concepts and his use of ceramic data, which calls into question his overall results. More importantly, the strongest aspects of Fiema's study have been to widen the debate regarding the *limes* question and to demonstrate the strength of archaeological methods in solving it.

## A new model for Roman imperialism in Jordan

In light of the deficiencies noted in the above models and a general dissatisfaction with Parker's model, this study seeks to build a more coherent model to pattern and interpret Roman military variation. This is formed along two lines: a reinterpretation of how Roman imperialism works at an archaeological level and how that may be interpreted better by using a landscape model.

### Roman imperialism and resource control

The comparative study of imperialism (*e.g.* Alcock *et al* 2001) has already established a broad understanding of what defines ancient empires. Put simply, imperialism can be defined as the process of creating and maintaining empires (Sinopoli 1994, 160). This deliberately broad view avoids the period-specific terms and debates of the sort discussed above. Moreover, the ancient imperial state is usually viewed as an essentially exploitative agency, maintaining and building a material infrastructure to tax, exploit and control its chosen area (Barfield 2001, 29). However, within Classical archaeology, Bartel (1980/81, 13–14) had long pointed out that archaeological indices for imperialism were lacking. As it is clear most Classical period scholars relate imperialism only to historically attested sources, this means that archaeological data is primarily viewed as an expression of these sources. This results in a highly limited view of the full picture of imperial control, as is evident from Isaac's misguided criticism of Luttwak's model of empire.

As made clear above, scholars such as Parker (Parker 1986a, 4–5), view Roman military systems as the sole index for imperialism. However, if one allows that Luttwak's model of the territorial empire is correct, then it is clear that the transformation from a hegemonic system would have effected a broad range of structural changes beyond purely military tactics. This would have entailed a greater integration with wider socio-economic fields. This means that military systems become the main, but not sole, index of the expression of Roman imperialism.

In this study, military systems are viewed only as the "key" to understanding imperial control. The primary focus is on aspects of power relations in a classic "colonialist perspective" (Lightfoot & Martinez 1995, 473). Such power relations are expressed mainly through the domination of economic and military fields. These areas can be mapped through the archaeological correlates of these behaviours, which are military sites in this case (Bartel 1980/81, 14–15) (Findlater 2002, 139). Thus the initial focus of the study is to map the location of military sites through a landscape of economic and military resources.

The ability of imperial states to protect, manage and exploit resources is fundamental to the sustainability and stability of this type of organisation (Sinopoli 1994). Resource control in the marginal area under study is critical to the success of any state. In fact, the control and management of a resource like copper (which exists in great quantity in the study area) may have led to state formation in the Iron Age (Knauf & Lenzen 1987, 86) or perhaps the *raison d'être* for the presence of military sites in the Wadi Arabah (Rothenberg 1972) (Findlater 2002, 139).

While Parker (1986a, 1997a) and Graf (1997a, 1997b) view military sites solely as consumers of material resources in terms of supply lines, food etc, this study recognises the wider structural integration that Luttwak's territorial model implies. Therefore, Parker's view that military deployments were based on "perceived security concerns and available logistical resources" (Parker 1997a, 116) only reflects one aspect of the picture. Moreover, as Parker limits his view of "security concerns" to military threats he provides no structural links to wider socio-economic concerns of the imperial state. While Isaac (1992) argued the case against the models developed by Parker, he too viewed military deployments solely in terms of military concern about political security.

In the context of this study, the term resource refers not only to natural resources for economic exploitation but also control of trade and communication routes (Findlater 2002, 139). However, this is to categorise resource control as an almost modern capitalist view of imperial primary state access to raw resource areas (Osterhammel 1997, 71–79). It must be remembered, in contrast to the incorporation process in the Western empire, the territories of the East were highly developed and on an economically structural level (if not superior) with the Romans. Therefore, one should expect a variety of resources, geared to the demands of a developed state, already in place upon annexation. These would have included trading centres, industrial institutions or agricultural estates.

The control of a resource may be managed at a variety of levels and the hierarchy of sites associated with such processes must be explicitly demonstrated. In this regard,

archaeological evidence may show signs of clustering around resource areas, demonstrating a high degree of control. Alternatively, control of resources by states may have been parasitic where only access to the area was regulated. Such a pattern may distribute along routes or distinct landscape features. In archaeological terms this may be achieved by observing patterns in the spatial proximity of key archaeological sites (here military sites) to resources and settlement types (Harfield 1988) (Findlater 2002, 139).

### Landscape perspective

Most studies of Roman military sites are rooted in some form of landscape perspective (Parker 1986a, 11). This partly reflects an appreciation of the tactical location of the site for defensive purposes. Thus there is a strong emphasis on the functional aspect of these sites. Moreover, most scholars are aware of the limiting nature of the local environment in regard to proximity with water resources and road networks. However, they do not attempt a conscious landscape perspective when attempting an historical or archaeological reconstruction of the period. The lack of a better-conceived spatial approach undermines most reconstructions of the Roman military in this area. By entirely concentrating on political and military explanations for military variation, the wider socio-economic context of the imperial process cannot be fully explored. It is at a landscape level where this wider context is seen most clearly.

Within Jordan and Israel the existence of Roman military frontiers and systems are viewed as specific to that period and separate from the development of the socio-economic system through time (Young 2001, Eadie 1986, 1989). While some Israeli scholars see links between Iron Age and Roman defensive systems, this approach is stimulated more by modern political processes than true structural links (Aharoni 1967; Mayerson 1990). In Jordan, apart from Fiema (1991), there has been no attempt to situate these sites in a wider settlement pattern. Therefore, most studies do not view Roman imperial systems within the longer timescale of the first millennium BC rise of the imperial superstate and increased settlement density.

This is rather surprising given the increased application of regional survey projects in the area since the 1970s (Ibrahim *et al* 1976; Yassine *et al* 1988; Ibach 1976, 1978; MacDonald 1988, 1992; Miller 1991). These studies clearly demonstrate the rise of settlement density and increased site hierarchy since the Iron Age. However, most of these studies, rooted in general explanations of rise and fall of settlement patterns, concentrate on rural patterns of settlement behaviour. More practically, the increased use of sophisticated spatial sampling

survey techniques means that the more widely dispersed military sites rarely figure apart from examples of single towers or fortified farms (Banning 1996).

Thus, Roman frontier studies have to operate at a full landscape level, taking all aspects of settlement rise and fall into consideration, including, for example, the expansion of Iron Age settlement and the rise of superstates from the first millennium BC onwards. However, it is not practical to insert the dataset of Roman military sites within the usual regional survey datasets of settlement rise and fall. There has to be some reconfiguration of the correlation of the military landscape and the economic landscape of settlement patterns.

## A new model of the military landscape

The term landscape originates from the sixteenth century, when it was used by painters to denote the illustration of natural inland scenery, as distinguished from a nautical scene or portrait. The word comes from the Old English *landscipe* which derives from the Dutch *Landschap* (Oxford English Dictionary Online). While the etymology of the word landscape may seem distant from contemporary usage where the word has mutated into many different types (cityscape, dreamscape etc.), the original meaning still carries the basic paradox. At once the word signifies a seemingly natural landscape, but one that is defined, shaped and interpreted by humans. Muir (2000), in a discussion of the uses of landscape in modern research, divides the approach into two camps. The first is the study of natural processes that shape the physical environment and determine the framework in which human occupation is enacted. The second approach documents the impact of humans on the land and environment.

The first approach is one that is intimately tied up with the rise of scientific method in archaeology, stemming from the progress of the natural sciences in the nineteenth century. From the 1950s onwards, with the rise of New Archaeology, with its emphasis on a scientific method and framework (i.e. hypothesis building models) linked to a systemic view of culture, this was the main way of reconstructing past landscapes. Typified by the methods and approach of scholars such as Butzer (1982) who sought to develop a view of landscape rooted in environmental concerns, this entailed the view of landscape beyond the human timescale where it provided a framework for human interaction. Thus, the local environment of the site, natural resources available and human subsistence activities explained human interaction in the landscape. This was aided by the development of geographical locational models of settlement patterns working within modern notions of efficiency and optimisation (Butzer 1982, 258).

As Macumber's (2001) recent contribution to the Archaeology of Jordan volume testifies, this approach is still the dominant model for landscape studies in Jordan. Macumber treats an evolving landscape solely in terms of changes to the climate and physical environment on the basis of the physiographic provinces (*ibid.* 1) used by environmentalists. The inclusion of his article at the start of the volume mirrors other large-scale survey project final reports (*e.g.* MacDonald 1988, 1992) in Jordan where the landscape and environment report is at the start of the volume. Thus landscape is treated as an introduction, background or framework to human interaction.

Even more advanced landscape-orientated projects still use this approach. Barker's four-year study of the Wadi Faynan, centred on the Classical field systems associated with the main settlement of Khirbat Faynan (*Phaeno* in the Byzantine period), had as its main aim the investigation of the relationship of people and landscape in a semi-arid environment (Barker *et al* 1997, 1998, 1999, 2000). The project focused on the process of desertification and environmental degradation. Barker (1995, 1–17) has long held the view that landscape archaeology is an amalgam of approaches and methodologies that can provide information on the *longue durée* of human settlement. In many ways the link with Braudel's (1972) historical models to reconstruct Mediterranean history and archaeology have been very influential (*e.g.* Knapp 1992). However, this only categorises landscape as a long-term phenomenon, which denies the historically contingent factor in landscape orientation and manipulation.

Another approach has emphasised the socio-symbolic aspects of landscape, and represents a conscious reaction against the above approaches that view the landscape in purely functional terms. Cosgrove, in particular, referred to such approaches as "an impersonal expression of demographic and economic forces" that ignored the layers of symbolic meaning in the landscape (Cosgrove 1989, 120–127). In archaeology, this movement towards symbolism was part of a wider trend, termed postprocessual, to move past systemic models and explore the idealist aspect of people's lives. The perception of landscape by participant peoples is the dominant feature of this type of landscape reconstruction (Johnston, 1998). Thus Fleming (1990) argues for the development of the concept of community, rather than site, region etc., as the most useful basic unit for the development of landscapes. He advocated the primacy of a "mental map" of the landscape as the basic indicator of cultural processes. The logical extension of this view of landscape as a perceived one is that each individual views the landscape differently through space and time (Roberts 1996, 12–13). However, scholars recognise the limited value of an ideational perspective and stress the blend with the material

world where all is in a state of flux (Thomas 1996, 91). Ingold (1993, 172) has advocated that instead of interpreting the landscape one should look for meaning which is embedded. Witcher (1998), in an examination of the impact of Roman roads in the landscapes of Italy and Britain, using phenomenological perspectives of constructed space (Tilley 1994), shows how landscape can be perceived from many perspectives.

This ideational approach represents a clear post-modern tradition that denies the rationality and detachment of western scientific thought. In their discussion of the role of landscape archaeology in Jordan, Finlayson and Dennis (2002, 221) criticise the orthodox "western" view of landscape as a snapshot, a synchronic view devoid of the internal context of the peoples under study. They give an example, from Australian aboriginal culture, where landscape is viewed differently – as fluid and timeless. This, like the examples Ingold offers from studies of the Western Apache in America (Ingold 1993, 171), can only ever relate to fairly complete contemporary self-descriptions of people and their environment. Although the internal view of a people's/a person's landscape is of course desirable to reconstruct a full picture, the evidence is hardly ever available in prehistoric or early historic periods. Thus the observer's view of the past landscape is nearly always the only one available. Also there is an assumption that western scholars, with western notions of time, place and landscape, cannot fully understand non-western cultures, but only add to layers of interpretation (Ingold 1993). This view has gained strength in the post-WW2 anti-colonial movements that asserted political independence from western empires.

However, the approach used in this study is based on the methods developed by Hoskins (1977) whose work sought to delineate the succeeding impact of people on the landscape of Britain. Hoskins' method uses an inductive approach that does not refer to larger theoretical issues but concentrates on the empirically observed archaeological and historical evidence. He views landscape as a text where each period writes its own story. This view of landscape as palimpsest is a powerful metaphor that gives a clear, creative role to each succeeding period that "overwrites" the previous period's patterns. In this way, the method is to distinguish, by diagnosis, the pieces of each period and to build up an evolution of the landscape through space and time. Such an approach fits in well with the archaeological Culture History method that places series of artefacts in a set time and space coterminous with peoples. It also allows for the creative approach of people in the shaping of the physical landscape.

Hoskin's concept of landscape has a clear focus on the spatial organisation of peoples. He stresses the dynamic element in the spatial correlates of human behaviour. In this study, the

use of spatial correlates is seen as useful antidote to the dominance of typological correlates, such as Culture History methods, that has hindered the *limes* debates. This stress on spatial organisation has been used successfully in some colonial contact studies as a useful way to progress out of a static debate (*e.g.* Lightfoot 1995; Lightfoot *et al* 1998). However, within the Hoskins model of landscape, the primacy of settlement context is stressed (see Roberts 1990).

However, in an archaeological framework, this approach is linked to the methods of field survey. This is discussed more in Chapter 5 when the method and research strategy of the Dana Survey is reviewed. It is sufficient to note that these field methods, when used in conjunction with a landscape approach, demand a more intensive and creative field interaction than traditional single site sampling or more highly systemised quantitative sampling methods. The landscape approach outlined here requires a more empathetic connection that almost takes the concept back to the original meaning of the word as an interpreted view.

### Historical idealism and landscape reconstruction

Collingwood (1946) expounded in his theory of historical idealism that the central element of historical reconstruction was for the historian to rethink the past thoughts of peoples empathetically. By so doing, one would understand individual actions in the light of a more generalised definition of a culture and its framework. This historical approach is one that is used very frequently in Classical history and archaeology where specific evidence is rarely available. It is readily observable in the reconstruction of Roman *limes* where the location and development of Roman forts are explained as a varying political and military strategy (*e.g.* Parker 1986a; Isaac 1992).

In many studies, when discussing Roman imperialism, the poor correlation of textual and archaeological data has not resulted in a satisfactory explanation of the nature and development of the military frontiers in Jordan. As this chapter demonstrates this is partly because of the misapplication and incorrect use of archaeological models. Thus, while the empathetic model of Collingwood is accepted as a proper avenue of historical enquiry, this study advocates that a sustained and creative use of the spatial correlation of landscape features with military remains can be highly effective. This entails a "debate" in the landscape where correlated spatial features must be understood in the field. However, this study does not follow more post-processual models that negate the emic/etic distinction (*cf.* Tilley 1994). It is important to view the spatial structure of sites within a historical framework.

Finlayson and Dennis (2002, 221), somewhat curiously, after stressing the importance of perception in the landscape, deny the validity of the modern researcher's own experiences in any landscape being studied. They term it a "naïve assumption that we can understand landscapes through regular physical proximity". Rooted in a cognitive view of landscape, this not only denies the creativity of the researcher to filter out modern perceptions but also ignores the empathetic approach that Collingwood (1946) emphasised as central to historical reconstruction.

While Finlayson and Dennis provide examples of a prehistoric landscape that has altered substantially, this would not hinder empathetic reasoning using the modern landscape as an analogue for the Classical landscape. However, for example, as MacDonald has shown in the area around Jurf Ed Darwish (MacDonald 1999, 2000b), there are substantial remains of Palaeolithic scatters on what would have been the shores of lakes, and during this period the area was covered in jungle-like terrain. In this instance regular physical contact in the modern landscape would be of little value and the nearest analogues would be in central Africa or South East Asia. It is clear, however, that the modern environmental landscape is familiar, if not completely similar, to the Classical period in Jordan (Koucky in Parker 1987a). Thus some kind of empathy is possible regarding distances covered, location of springs, wadi routes etc., and can give a sound insight not only into the nature of location but also the movement of peoples.

This empathetic approach was, of course, used in some degree by previous surveyors, such as Brünnow & von Domaszewski (1904, 1905), Poidebard (1934), Stein (Gregory and Kennedy 1985) and most notably by Glueck (1934, 1935, 1939). These scholars have been rightly criticised for poor archaeological methods that resulted in frequent over-interpretation of the datasets (Gregory 1997, 19–32). However, the validity of the survey techniques of prospection, looking for spatial structure in the landscape, cannot be faulted.

Earlier surveyors such as Glueck (1934, 1935, 1939), who carried out such massive surveys of Jordan in the 1930s, would, for example, record a square structure on a hill, designate it a fort, link it with others, build a military system and thus construct states/kingdoms. It is important to understand that the overall approach is not wrong. The identification of patterning in the archaeological record is fundamental to the analysis of sites in the landscape. However, the grave weakness in Glueck's (and other surveyors') methodology was the initial interpretation of a site's function. However, as most of these scholars were not explicit in the interpretation of structural linkages or explanatory models, the force of their field observations was diminished.

While a landscape approach can be used in a review of existing datasets, it has to be tested with primary data. Thus, the research strategy of the project used for the primary data presented in this study, the Dana Archaeological Survey, was consciously targeted towards the establishment of spatial structure in the landscape. By targeting military sites in the landscape, through a strict methodology in site definition and hierarchy, the survey used the model of imperial resource control to demonstrate the varying patterns of Roman control in the landscape. This approach has yielded considerable results and the following chapters will demonstrate the project's success at reinterpreting some features of the frontier/*limes* system.

## Conclusion

The debates between Parker, advocating a purely military interpretation for the frontier area, and scholars such as Graf or Isaac arguing for internal concerns, form part of wider debate on the nature of Roman Imperialism. However, it is an inadequately articulated debate which neither fully engages with the wider issues of imperialism or imperial strategy, nor effectively rationalises the local archaeological contexts. While there are clear divisions within these debates, with explicit notions of two camps resulting in a very polemic interchange of views, neither side uses archaeological data in a rigorous manner. The frequent clashes over the nature and scale of the "nomadic menace" use the same archaeological dataset without effectively defining its nature and extent. This is partly due to their obvious antipathy towards the validity of historical observations made on the basis of archaeological data. In this regard, the sustained criticisms of Parker's methods are unfounded, since his approach is relatively well-founded in archaeological practice. However, the lack of integration of military distribution with wider settlement patterns means that the dataset of Roman military sites is poorly contextualised. Therefore, Parker, like earlier scholars, seriously over-interprets the scale and distribution of military sites. The responses to the dominant military models, with several notable exceptions such as Fiema, can be characterised by a misunderstanding of the archaeological dataset. Scholars, such as Isaac, routinely use historical data to directly validate archaeological material.

By adopting an explicit "colonialist perspective", this study presents the analysis of military sites, not as an end in itself, but as a key to understanding the full dynamic of Roman imperialism. By viewing this imperialism in a broadly defined concept of resource control, a model of spatial correlates of imperial behaviour can be constructed. This study advocates a move away from the typological linkages of Culture History methods, which stress artefact ratios etc., to a model stressing spatial organisation as a defining framework. This landscape approach, used within historical parameters, can generate an alternative hypothesis of

imperial control within a more securely contextualised archaeological record. When used with the model of resource control in an imperial system, it has the potential to develop the core questions of the existence of Roman strategic aims.

# Chapter 3

## Review of military site location: textual evidence

### Introduction

This chapter will analyse and evaluate the textual evidence pertaining to the location and distribution of military sites in southern Jordan and Israel. This area includes the Roman provinces of *Arabia* after the incorporation of the Nabataean Kingdom in AD 106, which covers most of the area of southern Jordan and the Negev. This area then became *Palaestina Tertia* at the end of the third century (Figure 15, page 329). The evidence will be dealt with in chronological order, as it is important to set the progression of change evident through distribution and location. However, it is important to note that the prime documents recording military locations are the *Notitia Dignitatum* (late fourth century) and the Beer Sheva Edict (early sixth century). Before the *Notitia Dignitatum*, there are no major textual references to military locations (Kennedy 2000, 22). Although earlier documents mention military locations, only these two list complete or nearly complete distribution of sites. Thus, the method employed by historians has been to work back from these documents. As the *Notitia Dignitatum* clearly echoes the Diocletianic reorganisation of the army in the late third century, this approach has been partially successful. However, to date, in Jordan no overall picture of Roman military distribution was possible for all periods.

### Research background

While this study is clearly situated within an archaeological context, the textual evidence of military locations is considerable, if not entirely consistent, across all periods. The approach employed here is similar to that used by Isaac in his discussion of the army in the Negev during the Byzantine period (Isaac 1998, 450–466). He wanted to estimate the strength of the Byzantine army prior to the Muslim invasions of the early seventh century. Therefore, he correlated several of the textual sources to show that there was no decline in troops during the fifth and sixth centuries, as Parker (1986a) and Fiema (1991) would argue, but that numbers remained the same until the late sixth century (Isaac 1998, 464–465). This simple task had not been attempted before for the Israeli evidence and Isaac used it to argue that there was no centralised imperial military strategy to repel strategic threats (*ibid.* 466).

Isaac's treatment had not been attempted for southern Jordan. Bowersock (1983), in his discussion of the maps of Arabia, touches on the location of military posts but is more

concerned about discussing ancient geography. Gregory (1997), while using *in-situ* inscriptions to date forts, did not fully use the wider textual references to forts in her analysis of site location. Similarly, Parker (1986a, 1997a) really only used the evidence from the *Notitia Dignitatum* to analyse troop distribution in this area. However, this was never fully integrated with his archaeological work. The same situation occurs in Fiema's (1991) study where, like Isaac, he wanted to explain the lack of Byzantine troops in the area before the Muslim invasions. Although he compiled a list of sites with military locations (*ibid.* 295–305), it was not viewed as diachronic tool to reconstruct changing military patterns. In this and his subsequent overview of military sites (Fiema 1995), Fiema mainly relies on archaeological evidence to prove his analysis. Kennedy (2000) is assiduous in listing the specific textual references for each site but the format precludes an overall assessment. However, Kennedy will provide an overview of the Roman Army in the fourth century which correlates the archaeological evidence with the *Notitia Dignitatum* (Kennedy pers. comm. & 2000, 50).

Nevertheless, it is clear that the full range of textual evidence has not been used to maximum effect. Within the context of this study, the plotting of military site locations through space and time is crucial. It is not the intention here to plot historic movements of units but to ascertain military locations and present them in a spatial and temporal landscape. Contrary to the single period reconstructions of earlier scholars, this chapter will expand on Isaac's treatment of the Israeli sites and analyse the Jordanian material. However, as is clear from Isaac's discussion, the location of many sites is unclear, thus the bulk of this chapter will be a critical analysis of all of the documents noted below. In addition to the material used by most scholars (which are listed below), this study will encompass two further textual sources: Ptolemy's *Geography* and the *Tabula Peutingeriana*. Neither of these sources contain explicit military locations but, as contemporary maps of the area, they are invaluable for site location. However, it must be remembered that maps are representations of current socio-political conditions (Nicolet 1991), thus many of the sites listed in what may seem purely geographical works were probably important locations in the current state infrastructure of the time.

Therefore, the texts analysed in this chapter are: Ptolemy's *Geography*, which was probably written in the middle to late second century in Alexandria; the *Tabula Peutingeriana*, which is a twelfth-century copy of an ancient road map that may date to between the second and fourth century; the *Onomasticon* by Eusebius, dating to the end of the third century; the *Notitia Dignitatum* which lists the civil and military branches of the Empire at the end of the

fourth and the beginning of the fifth century; the Beer Sheva Edict, an inscription derived from the fragments of several imperial edicts dating from from the early fifth to early sixth century; the Nessana Papyri, of the same date as the Beer Sheva Edict; and finally, the Madaba Map of *c.* AD 550. Further lists of sites prepared by two Byzantine writers – Hierocles' *Synecdemus* and the Description of George of Cyprus (Honigmann 1939) – are included in the final correlation of sites. They appear to be based upon official lists. As they do not contain any information regarding the location of sites, however, they have not been analysed in this study but are used to check against contemporary names.

The results of this approach are tabulated in Table 11 (page 355) where names and locations are correlated across time. Once consistency can be achieved with the evaluation of the textual evidence, only then can it be compared with the archaeological evidence. Each document is analysed chronologically from earliest to latest. The basis of this study's list of sites is taken from Fiema (1991, 295–305), then enlarged to include sites in the Negev. However, the discussion also covers the location of many Israeli sites as they have a bearing on the pattern and location of Jordanian sites. It must be noted that after 1948, many of the sites in Israel were allocated new Hebrew names, usually based on Biblical attributions. This was a politically motivated action aimed at erasing the Arabic names from the landscape (Cohen & Kliot 1992). However, it has meant that some sites now have several different names, which can be misleading in the current literature. To be consistent, when the discussion relates to toponymic analysis, the Arabic names are used. However, when the discussion relates to post-1948 archaeological surveys and excavations by Israeli scholars, the current Hebrew names are used.

It is my intention to link the textual and archaeological evidence to build up an accurate picture of military variation through space and time. One must be rigorous in establishing a correct methodology to identify sites and their locations. In the nineteenth century, scholars established three main methods of site identification: contemporary historical or topographic information; toponymic analysis of the current site name; and archaeological evidence of date or origin (see MacDonald 2000a, 13–19 for an overview). When properly correlated, these three methods can be powerful tools for site identification. However, in many studies to date they have been improperly used, and consequently, circular arguments have ensued around hypotheses which were based on wrongly correlated pieces of information. It has been a prime aim of this study, therefore, to identify pattern and consistency within each method before attempting to correlate the data.

The textual data used in this study ranges from the second century to the sixth century. As such, it covers most of the period of Roman rule in southern Jordan. However, the historical data for the beginning of the province (Freeman 1996a) and the dissolution of Roman rule (Kaegi 1992) is so sparse that individual mentions of military locations during these periods will not be analysed here. The main aim of this chapter is to review textual sources that provide a geographical overview of the area. The main issue with individual citations is the problem of context. Thus, within the Babatha Archive (Lewis 1989, *P. Yadin* 16), the reference to a military officer at Rabbathmoab (Er Rabba) in AD 127 is extremely interesting for issues regarding the census and the role of the Army, but without more evidence it is unclear if there was a garrison there. Similarly, the Petra Papyri (Koenen 1996; Gagos & Frösén 1998) contain a wealth of detail about land disputes around Petra but it is unclear if this can be applied to a wider area. At best, these isolated data can only be corroborated by larger datasets.

Although primarily an archaeological problem, the nature of inscriptions (tomb, dedicatory, monumental etc.) found on sites presents further problems of textual context. While northern Jordan is replete with military inscriptions, as Figure 16 (page 330) amply demonstrates, there are only a few in the south. Two are military inscriptions from known sites at Aqaba (MacAdam 1989), which date between AD 324–337 (*ibid.* 171), and several from Humayma (Oleson *et al* 2002) from around the third/fourth century. Another, from Petra (Zayadine & Fiema 1986), probably relates to the early part of the provinces in the second century. Again, such scattered data should only be used to only corroborate larger datasets.

### Ptolemy

The eight books of the Γεωγραφική ὑφήγησις of Ptolemy date to sometime from the mid to late second century (Toomer 1975). Now known as the *Geography*, it is the only book on cartography to have survived from the Classical world. Of immense importance to the beginnings of modern geography, it details in Book 1 the principles and theory for drawing a map on a globe and on a plane surface using two map projections. Of greater relevance for ancient historians, however, are the almost 8000 places listed in Books 2 to 7 that are accurately located by Ptolemy's system of co-ordinates in latitude and longitude. In particular, Book 5, Chapters 15 and 16 detail sites in modern southern Israel and southern Jordan. Unfortunately, the manuscript tradition has resulted in variant copies of the work with different co-ordinate readings occurring throughout (Berggren & Jones 2000, 41–62). Some of these variations may be due to successive revisions made during antiquity, especially in the later Byzantine period (Dilke 1985, 81 quoting Polaschek 1965, 711–734).

## Problems with Ptolemy's work

The earliest, most complete manuscript is the Vatican manuscript *Urbinas Graecus 82* (Fischer 1932), but it does include many later Byzantine revisions. Unfortunately, the only manuscript uninfluenced by Byzantine revision (*Vatican Graecus 191*) omits all the co-ordinates from Book 5, Chapter 13 onwards (Berggren & Jones 2000, 44). For scholars, these difficulties are not helped by the lack of a comprehensive modern edition. The most widely referenced work is that of Nobbe (1843–1845), although it does not cite enough of the variant readings to be considered a complete work. The work that is cited in this study is Wilberg (1838–45) who does report variant readings from the most important manuscripts. This was used in conjunction with the Vatican manuscript cited above (Fischer 1932). The list of ancient locations used with co-ordinates and modern correlations are contained in Table 1 (page 331).

As well as doubts over revised or incorrectly copied variants of the text, it is difficult to judge the accuracy of the readings given in the lists. The errors and mistakes with Ptolemy's main projections are well known (Berggren & Jones 2000, 20–22) but, for most locations, the source of his data (and hence any error) is lacking. Although Ptolemy listed a series of places as having a more accurate location in Book 8 (Berggren & Jones 2000, 19–20), he did not evaluate the whole corpus of data. Indeed, his criteria for inclusion of a site are mysterious: was it merely that he had the data available in whatever form? Berggren & Jones (2000, 23–30) list the types of data that Ptolemy may have used: earlier geographer's books or maps, travel itineraries, histories, and astronomical observations. Ptolemy stated explicitly in Book 1.4–6 that it was not his task to gather data but to evaluate critically earlier material. Thus, his data may be inconsistent.

While many studies of other parts of the ancient world deal with these geographical problems (*cf.* Rivet & Smith 1979), the towns and cities of *Arabia Petraea* and *Palaestina* have not been assessed at this level. Aharoni (1963), in his discussion of the location of the ancient site of *Thamara*, dismisses Ptolemy's co-ordinates as increasingly inaccurate the further east ones goes from the Mediterranean coast. He does not refer to a map in this discussion. Similarly Bowersock (1983, 164–186), in his discussion of the ancient maps of Roman Arabia, does not deal with Ptolemy's map as fully as the *Tabula Peutingeriana* or the Madaba Map. He reproduces maps from the *Codex Urbinas Graecus 82* (*ibid.* Plate 3) and the *Codex Vaticanus Latinus 5698* (*ibid.* Plate 4) but does not evaluate the respective locations of sites. Moreover, it is unclear why histories of the period reproduce Medieval/Renaissance maps as an illustration without discussing the variant co-ordinate

readings of the sites. However, Bowersock while discussing the geography of *Arabia* states that "although the originals.....are now lost, his work (*Ptolemy*), *with the maps*, was reproduced so frequently in the Middle Ages that...the many maps..give a relatively clear indication of what his maps looked like for the areas concerned." (Bowersock 1983, 170 – my italics). Clearly Bowersock, like most other historians, treats Ptolemy's work as a textual source to be slotted into a manuscript tradition. However, referring to medieval maps is not needed in the process of locating ancient sites. Ptolemy's maps can be produced using his co-ordinate system only, and should be assessed on its own merits, except to note the variant co-ordinate readings.

## Previous analyses

Thomsen (1906), in his seminal study of Ptolemy's site locations in the southern Levant, used as his prime methodological tool the site name topoynmic tradition. He did not plot the site locations on a map and this approach has continued to this day. Rather, he based his site identifications in the Negev on the antiquarian explorations of Palmer (1872). Also, he assumed, due to the similarity of Ptolemy's sites with the slightly later *Tabula Peutingeriana*, that most of the sites ran on major road lines.

Therefore, in Thomsen's map (Figure 17, page 332) the first seven sites before Petra in *Arabia Petraea* (see Table 1, page 331) – Εβοδα (*Eboda*), Μαλιάτθα (*Maliattha*), Καλγουϊα (*Kalguia*), Λύσα (*Lysa*), Γούββα (*Gubba*), Γυψαρία (*Gypsaria*) and Γέρασα (*Gerasa*) – were placed along certain routes apparently without reference to the locations plotted by Ptolemy. Εβοδα (*Eboda*) and Καλγουϊα (Kalguia) were placed on a route to Petra and the rest of the sites were placed along a southern desert route that ran from Ἔλούσα (*Elusa*, Khalasa) to the southern Wadi Arabah and on to Aqaba.

In his discussion of these routes, Alt (1935), relying on Frank's (1934) archaeological surveys, placed all the sites on the Petra–Gaza road and then down the Wadi Arabah to Aqaba. Aharoni (1954), while discussing the Roman road to ancient *Aelia* (Aqaba), placed the sites from Λύσα (*Lysa*) to Γέρασα (*Gerasa*) along a similar route to Thomsen's locations (Figure 17, page 332). However, Meshel and Tsafrir, in their discussion of the road system from modern Avdat to the Wadi Arabah (Meshel & Tsafrir 1974 & 1975), did actually plot Ptolemy's locations to demonstrate textual references to the main Nabataean trade road that would have gone from Gaza to Petra (*ibid.* 16–21). They again concluded that Ptolemy's sites ran along road lines and placed the sites of Εβοδα (*Eboda*), Μαλιάτθα (*Maliattha*) and Καλγουϊα (*Kalguia*) along the Petra–Gaza road. They also concluded that Thomsen's

original locations of Λύσα (*Lysa*) to Γέρασα (*Gerasa*) were probably correct (Meshel & Tsafrir 1974, 20 Note 49).

Apart from the identification of Εβοδα (*Eboda*), which has been conclusively proved to be modern Avdat (Arabic 'Abda), the rest of the sites discussed above have no corroborative ancient data to verify these scholars' identifications. However, one should note the three methodological devices that all used to locate these sites: toponymic analysis, presumptions of Ptolemy's database (*i.e.* that sites followed major road lines based on road itineraries), and archaeological survey. While it cannot be denied that all three techniques have been successfully used to inform site location in this area in general, it is surprising that no one, apart from Meshel & Tsafrir (1975), plotted Ptolemy's locations and attempted some geographical analysis. Indeed, the plotted locations are at variance with all the locations postulated, apart from Alt's (1935) proposition that they followed the Wadi Arabah.

### Present analysis

Within this study, Ptolemy's site locations of the southern area of Παλαιστίνη (*Palaestina*) and Πετραία Ἀραβία (*Arabia Petraea*) have been drawn (Figure 18, page 333) using the co-ordinates (and variant readings) given in Wilberg (1838–1845, 371–375). The following table (Table 1, page 331) lists all the sites that may have had later military occupation. Some are important for tying down communication routes and others have been included to demonstrate the consistency of site locations in Ptolemy's work. All the sites in *Arabia Petraea* have been included, as well as some in *Palaestina*. The table gives the ancient Greek name with the modern location and text citation. Although the map has been drawn using the co-ordinates in the main text, listed on the first row in each column, the variant readings from other manuscripts have been given on lower lines. While these variant readings have not been drawn on the main map, their existence has to be acknowledged in the process of site location. The specific textual references for these readings have not been included, as it is not germane to this study's specific analysis of site location.

### Israel

It is difficult to work with Ptolemy's locations, but it is clear that at least on the modern Israeli side the sites are relatively consistent when compared to the known modern sites. If one compares the relative locations of Ελουσα *(Elusa)*, Εβοδα *(Eboda)* and Μαψ *(Mampsis)* in Ptolemy's map with their modern locations as in Figure 19 (page 334) there is a broad similarity. Also, the location of Ἐνγάδδα *(Engadda)* and Βηδωρώ *(Bedoro)* match the modern locations of Engaddi and En Boqeq. The latter site is also on the same latitude with

Βέρζαμμα (*Birsamma,* Khirbat El Far). Similarly, there is a southern line of sites, Ελουσα *(Elusa)* – Μαψ *(Mampsis* – Θαμάρω *(Thamaro),* positioned along the same latitude. Although Aharoni (1963) has argued for Θαμάρω *(Thamaro)* to be located at Ain Hosb (mainly on the basis of distances contained in the later *Tabula Peutingeriana*), the initial identification of Θαμάρω *(Thamaro)* with Qasr El Juheiniye, as first discussed by Frank (1934), is confirmed by Ptolemy's location and the later Madaba Map position (see below). However, one should note Rothenberg's suggestion that the site be located at Ain Al Arus, about 10km south of the Dead Sea (Rothenberg 1971)

Thus, there is nothing to assume that Ptolemy's locations on the Israeli side are wildly inaccurate. In this way, the location of sites through Λύσα (*Lysa*), Γούββα (*Gubba*), Γυψαρία (*Gypsaria*) and Γέρασα (*Gerasa*), on a rough south-southwest – north-northeast line leading to Ἐλάνα (*Elana,* Aqaba) strongly suggests that the sites are located in the Wadi Arabah. These sites have always been assumed to follow the routes on the modern Israeli side of the Arabah (Tsafrir *et al* 1994, Southern Map). However, there is no reason to suppose that Μαλιάτθα (*Maliattha*) and Καλγουϊα (*Kalguia*) are on the route of the Petra–Gaza road. Εβοδα (*Eboda*) is certainly on this track, but if one accepts that Ptolemy's other two site latitudes are correct, then they almost certainly do not lie on this road and probably are located in Jordan.

## Jordan

The line Μαλιάτθα (*Maliattha*) and Καλγουϊα (*Kalguia*) with Petra on Ptolemy's map may give the impression of a line of sites along a road, but the Jordanian site locations are clearly inaccurate (see below) and cannot be used as evidence of this road line. In fact, the only major site to the east of Εβοδα (*Eboda*) is the oasis area of Ain Hosb (Figure 19, page 334) whose ancient name has not been satisfactorily identified (although see Aharoni 1963 for the argument that it is Θαμάρω *(Thamaro),* and Alt for *Eiseiba* (Alt 1935). Thus, if one accepts that Μαλιάτθα (*Maliattha*) is Ain Hosb, then Καλγουϊα (*Kalguia*) can only lie on the Jordanian side. The only site on this general latitude is Khirbat Et Tlah (DAS 192 & Kennedy 2000, 202), a fort, reservoir and field system that has ceramic dates from Nabataean to Early Islamic. There is another smaller site several kilometres to the south, Khirbat Hassiya (DAS 189 & MacDonald 1992, 86, 273 & Fig. 18), but it is a much smaller *caravanserai* site.

On the Jordanian side, however, to the north of the site of Αὐάρα (*Avara*, Humamya) there are clear discrepancies. For instance, Χαράχμωβα (*Charaxmoba*, Kerak) is clearly in the wrong place but could possibly be transposed with Κληθαρρώ (*Cletharro*, unknown).

However, it seems clear that Ptolemy's Jordanian latitude co-ordinates (*Geography* 16; Wilberg 1837, 373: 5–26; 374: 1–32; 375: 1–13) do not correspond well with the latitudes of known Palestinian sites. It would seem that his information source for this specific area was wrong. This is unfortunate as some of the names do not continue and locations are thus unknown. Fortunately, most of the other site names continue in other periods and appear on ancient maps or in later texts where the identification is clear. These are listed in Table 1 (page 331) without comment. However, Ptolemy's locations cannot be matched against Jordanian site names as confidently as they can be against the Israeli sites.

### *Tabula Peutingeriana*

The *Tabula Peutingeriana* is a twelfth century copy of an ancient road map that may date to between the second and fourth century (Dilke 1985, 113–120). Originally 7m long and 0.34m wide, it is now in 11 separate pieces (Weber 1976). This map shows the Roman road system with long-distance connections to India and China. It is not drawn to scale and presents a schematic representation of roads, with measured distances between major towns. It exists within a Roman tradition of road itineraries (Dilke 1985,113) that seems to run from the early Empire to the later itineraries for pilgrimage routes in the Byzantine Empire. There are clear later Christian elements to the map such as in the Sinai area (see Segment area sheet VIII and IX), where the legends "*Desertum ubi quadraginta annis erraverunt filii Israel ducente Moyse* (The Desert, where for forty years the children of Israel wandered under the leadership of Moses)", and below this, "*hic legem acceperunt in monte Syna* (Here they received the commandments on Mount Sinai)" are written (Figure 20, page 335).

While the map does not portray military sites and no boundaries appear within the Empire, it does clearly portray various aspects of the Empire's communication infrastructure. The names of regions are given but not graphically defined. The roads are shown as a series of lines with numbers indicating distances between named sites. Also, there is no distinction between major and minor roads. Most of the distances are in Roman miles but are listed in the Iranian areas as parasangs and in Gaul as leagues. Usually towns and places are not marked with a dot or similar but are graphically located by a crook in the road. However some locations are marked with a small stylised picture. These can be grouped as several main types. Of the 555 signs, 429 are marked by a small building with two towers (Weber 1976, 4). These are either *mansiones* or perhaps stages on the *cursus publicus* (Dilke 1985, 115). Forty-four signs show a simple rectangular building with pitched roof that seems to represent a temple. The remainder range from springs/watering places to storehouses/granaries, altars, governors' residencies and lighthouses. As was emphasised in

the introduction, while no military sites are noted, this is clearly a map showing the Empire's communication infrastructure. Fiema (1995) has shown that on the basis of archaeological remains most sites lay on routes. One can assume, therefore, that in this area many of the named sites were military ones.

The *Tabula Peutingeriana* is of great importance in determining the location of towns in *Arabia Petraea* as, once the route has been ascertained, it provides exact distances between sites, allowing for accurate identification. These routes can be verified exactly by archaeological survey as being based on Roman roads as they are still discernible in the landscape. Additionally, the *Tabula Peutingeriana*, following the same tradition as Ptolemy in naming sites, provides important clues which point towards the more accurate identification of several locations mentioned in the previous section. The connection between the *Tabula Peutingeriana* and Ptolemy's *Geography* has long been noted and discussed. Bowersock (1983, 170) noted that although there were Christian elements in the *Tabula Peutingeriana* (noted above), the majority of place names located in *Arabia Petraea* pointed to a common tradition from the Early Empire.

### Previous analyses

Bowersock's discussion of the *Tabula Peutingeriana* in his section on maps of Arabia (Bowersock 1983, 167–181) represents the current perspective on sites in southern Jordan. This was mainly based on the archaeological work of Brünnow & von Domaszewski (1904–05), the early preliminary work of Parker (1976, 1981, 1982, 1983, 1985) and Graf (1978, 1979, 1983). However, much more recent archaeological work has been done by Graf (1995) on the route of the *via nova Traiana* south of Petra, while Fiema (1993) and MacDonald (1992, 1996) have tracked the *via nova Traiana* south from the Wadi Hasa to the site of At Tuwanah. The DAS has now filled in the large gap between Fiema's and Graf's survey areas (see Chapter 6).

On the Israeli side, Finkelstein (1979) provided an overview of problems with the routes and place names. Finkelstein's treatment of southern routes in the Negev area was substantially based on Meshel's analysis of Ptolemy's *Geography* and *Tabula Peutingeriana* sources (Finkelstein 1979, 30 note 21 quoting Meshel 1973). He also used the later archaeological surveys of Meshel & Tsafrir (1974 & 1975) who mapped the Israeli part of the ancient route from Gaza to Petra.

It is only through the archaeological survey of ancient routes that one can assess the accuracy of routes outlined in the *Tabula Peutingeriana*. However, while most of the ancient routes in

*Arabia Petraea* are well known, they have not been surveyed fully. In this respect, Meshel & Tsafrir's (1974 & 1975) work stands out in its quality and detail. Along with other work in the area (*e.g.* Harel 1959, 1967), Israeli scholars have mapped the routes within their country in a fairly accurate manner. Such works have lead to comprehensive publications such as the *Tabula Imperii Romani* (Tsafrir *et al* 1994). On the Jordanian side, however, synthetic works are sadly lacking. Graf's publication of his work on the *via nova Traiana* (Graf 1995) does not have a sufficiently detailed description of the road and, lacking a suitably detailed map, cannot be used fully. Fiema's survey to the north is still unpublished (1993), and MacDonald's (1992, 1996) publications lack sufficient detail to analyse the road in depth.

## A new approach

In the following analysis of the routes and distances in the *Tabula Peutingeriana*, again, several routes have been calculated from maps. This time, maps contained in the *Tabula Imperii Romanii* have been used to recalculate certain distances (Tsafrir *et al* 1994, Southern Map). The drawbacks of this approach are obvious but it is the only suitable map (at a suitable scale) which contains ancient routes. As previously explained, while routes on the Israeli side are accurately reproduced, those on the Jordanian side have slights errors – based, no doubt, on the assumptions made by scholars without access to the area. The central route of the *via nova Traiana*, in particular, has slight errors in southern Jordan. These have been adjusted, for the present study, by incorporating the fieldwork of DAS, Fiema (1993), MacDonald (1988, 1996), and Graf (1995). Of course, without detailed maps or descriptions this approach can only provide approximate distances but, given the sparse nature of settlement within this area, it is usually fairly evident if a given distance refers to a certain route and location. In the calculations presented in Tables 2–4 (pages 339 & 342), one Roman mile is taken to be 1.48km (Berggren & Jones 2000, 14). However, it should be noted that Aharoni used a conversion of *c.* 1.47km (Aharoni 1954, 15 and Aharoni 1963, 41), while Graf (1995) used a formula that varies between 1.50–1.51km.

The data in Tables 2–4 (pages 339 & 342) present the distances in the *Tabula Peutingeriana,* with the new locations argued below (Figure 23, page 338), along with measured distances. In the tables, the distance from one site to another is expressed as the figure adjacent to the site in the lower cell. Where an asterix appears next to a measured distance it has been taken from a published source and is referenced in the body of the discussion. The discussion has been sectioned into three routes. The first is the route from Jerusalem (*Aelia*) to Aqaba (*Haila*); the second went from Jerusalem (or more accurately a turnoff near Hebron), through Kurnub (Israeli Mamshit) across the Wadi Arabah and up to meet the *via nova Traiana* on

the Jordanian Plateau; the third is that of the *via nova Traiana* from Amman (*Philadelphia*) to Aqaba (*Aila*).

### *Aelia* to *Haila* (Jerusalem to Aqaba)

The *Aelia* to *Haila* route has caused a great deal of discussion and two broad opinons have developed. On the one hand, scholars, beginning with Palmer's assessment of the route in the nineteenth century (Palmer 1872, 356), have followed a route that sits to the west of the Wadi Arabah and skirts the northern part of the Sinai (Figure 21, page 336). On the other hand, scholars such as Alt (1935), following Frank (1934), argued for the location of the route to be in the Wadi Arabah. The route in question is drawn on Sheet VIII (Figure 22, page 337) of the *Tabula Peutingeriana* as *Hierusalem–Elusa–Oboda–Lysa–Gypsaria–Rasa–Ad Dianam–Haila*. The distances between and identification of these sites has been given in Table 2 (page 339). Identifications with a question mark are newly proposed in this study while all scholars accept the others.

Thomsen (1906, 111–112) placed the route beginning just south of *Nessana* ('Auja el Hafir) through the south-west Negev desert to the Wadi Arabah at the site of modern Yotvata. However, Aharoni (1954) has argued strongly for a route that leads to the south of modern Avdat (*Oboda*) and turns south along the Jabal Ramon and then heads east to the Wadi Arabah (Figure 24, page 340). Aharoni has tried to show that the distances in the route correspond to the *Tabula Peutingeriana* numbers (Aharoni, 1954, 15) and this route has been entered in the *Tabula Imperii Romani* as the orthodox opinion (Tsafrir *et al* 1994 Southern Map). Meshel and Tsafrir (1975, 19–20) did not agree with Aharoni and questioned the toponymic identifications and lack of archaeological dates (*ibid.* 20 Note 49) to substantiate his proposal. Nevertheless, all these scholars saw this route essentially as running through the southern area of the Negev. It is odd that while the correlation of modern names with Ptolemy's names are widely accepted, as discussed above, the locations on Ptolemy's maps point to a north–south line, not to the north-west – south-east line that most scholars follow.

Alt (1935), however, argued for a route that leads directly from *Elusa* (Khalasa) through *Oboda* ('Abda) and then down through the Naqb Mahmal (Mahmal Pass) to the Wadi Arabah. He placed *Lysa* at El Bir, below Jabal Ramon, and also placed *Goubba* (known from Ptolemy's list as following *Lysa*) on this road in the environs of Moja Awad (Alt 1935, 57). Further, he put *Gypsaria* near Bir Maliha, which is now referred to as Beer Menuha (see Chapter 4) in the Wadi Arabah. He located the last site, *Rasa,* in the Wadi Thlah (modern Nahal Hashita some 20km south of Beer Menuha). Although Aharoni (1954) and then Meshel and Tsafrir (1975) rejected Alt's identifications on topynomic grounds, they both

used archaeological evidence to confirm the initial "fix". In particular, Meshel and Tsafrir, basing their data on Negev's fieldwork (Negev 1966) and ceramic chronology (*e.g.* Negev 1969) of this road, concluded that as the Petra–Gaza road had gone out of use by AD 106, the *Tabula Peutingeriana* route could not refer to this particular road. Cohen (1982a) has since conclusively shown that the Petra–Gaza road did not go out of use after AD 106 and indeed remained in use until the Late Byzantine period (Cohen 1982a, 246). Nevertheless, even allowing for this new data, the distances set out in the *Tabula Peutingeriana* do not tally with Alt's locations (Aharoni 1954, 12).

However, all scholars do agree on the identification of the last site before *Haila* (Aqaba) – *Ad Dianam*. This site is pictured as a house, which, on the *Tabula Peutingeriana,* denotes a temple (Weber 1976). It also shows a road leading to it from the *via nova Traiana* but this is accepted to be an error and will be dealt with in the section below on the *via nova Traiana.* The site has long been identified with a site in the Wadi Arabah called, in Arabic, Ain Ghadian or Khafriat Ghadian (Musil 1907–08, 186–190), which is now called Yotvata and is about 40km north of Aqaba. Unfortunately, the name *Ad Dianam* does not appear in other sources and the site's identification rests on three levels (as with most other sites). The primary factor is the similarity with the modern Arabic name – Ghadian (or Ghadhyan). However, it should be noted that the Arabic name derives from *ghada* which is the haloxylon bush that grows in abundance in the area (Stern 1993, 1517). Second, there are abundant Classical remains in the area (Stern 1993, 1517–1520 for summary and Meshel 1989 for the fort). The third is obviously the distance to the site from *Haila* (Aqaba), which was 16 (XVI) Roman miles (23.68km), according to the *Tabula Peutingeriana*, which poses a problem. As Aqaba was over 40km away, Aharoni (1954) posited a further mistake in the manuscript so amended XVI to XXVI, which would make it *c.* 39km, and this has been followed.

The three instances of 16 Roman miles between *Gypsaria*, *Rasa*, *Ad Dianam* and *Haila* seem very strange, as there are no archaeological remains that would match Classical sites at these equal distances. Furthermore, the *Tabula Peutingeriana* shows a road extending from *Ad Dianam* to the site of *Praesidio* (see Figure 25, page 341 – modern Khirbat El Khalde) which is on the *via nova Traiana* to *Haila* (Aqaba) on the Jordanian Plateau. This road represents the main Roman road to *Aila* which is the *via nova Traiana*, but it does not pass through Yotvata, so this is a mistake. Thus, there is good reason to be sceptical about the accepted location of *Ad Dianam* as Yotvata and its relation to *Haila* (Aqaba).

Without *Ad Dianam* to establish a fix for the route it is difficult to place other locations accurately. However, as it is established beyond doubt that *Eboda* is modern 'Avdat, then

one can measure 48 Roman miles (*c.* 71km) to the next site, *Lysa*. As has been argued in the section on Ptolemy's maps, the sites Λύσα (Lysa), Γούββα (Gubba), Γυψαρία (Gypsaria) and Γέρασα (Gerasa) were on a rough north–south line and therefore the routes proposed by Palmer (1872), which have been accepted by most scholars, through the northern edge of the Sinai appear ill-located. If one accepts that the sites are in the Wadi Arabah then they must lie at some point on the *Eboda–Petris* road. The sites proposed by Alt do not fit the distances laid out in the *Tabula Peutingeriana* (see Aharoni (1954) and Meshel (1973)). In fact, the distances do not work for the sites on the Israeli side of the Wadi Arabah, but if one considers sites on the Jordanian side, a certain consistency is achieved.

The first major site to be reached on crossing the Wadi Arabah on the Petra–Gaza road is Bir Madhkur. This major site has been known since Frank first surveyed it in the1930s (Frank 1934, 228) and it is now the object of recent survey (Perry & Smith 1998; Smith *et al* 1997). Both projects conclusively demonstrated the mainly Classical occupation of the site which contained a fort, *caravanserai* and a small settlement around a spring. Furthermore, the measured distance from Avdat is *c.*71km, which exactly matches the *Tabula Peutingeriana* figure (see Table 2, page 339).

The next site to the south of this is Khirbat Gharandal. This is another major site with a fort and a reservoir. Once again, Frank (1934, 231–232) surveyed it and established that the site was in use during the Roman period. The measured distance between this and Bir Madhkur is *c.* 40km, which reasonably matches the *Tabula Peutingeriana's* figure of 41.44km. It should be noted that Smith (Smith *et al* 1997) found clear evidence of milestones and a road between these two sites.

If one continues south, the next site to be reached, with an abundant water supply, is Yotvata on the Israeli side, which is *c.* 28km from Khirbat Gharandal. The *Tabula Peutingeriana* gives 23.68km as the distance between them. From this it possible to posit the following identifications (see Table 2, page 339): *Lysa* = Bir Madhkur; *Gypsaria* = Khirbat Gharandal and *Rasa* (Γέρασα, Gerasa) = Yotvata. Perhaps the site of Goubba (Γούββα) was located on the Israeli side and therefore did not form part of the main route. In this case it may possibly be identified with Beer Menuha (see Chapter 4).

If one accepts that Yotvata is *Rasa,* then *Ad Dianam* may be placed half way along the road to *Haila* (Aqaba). A small site, now called Horvat Zafit (see Chapter 4), is located between the two (see Table 2, page 339), *c.* 22km from Yotvata and *c.* 20km to Aila. However, the site is not particularly significant and has been interpreted by the excavator as a small way station. If one accepts that that the stylised picture of a house in the *Tabula Peutingeriana*

refers to a temple, then clearly Horvat Zafit does not fit this picture. In the 1976 edition of the *Tabula Peutingeriana*, *Ad Dianam* was placed at the mines of Timna (Weber 1976). This may be referring to the Temple of Hathor that was excavated by Rothenberg between 1969 and 1974 (Rothenberg 1988). Timna is situated to the west of Horvat Zafit among the foothills of the Wadi Arabah. It was a centre of copper mining from the Bronze Age up to the Early Islamic period (Rothenberg 1972). However, Rothenburg dated the temple from the Late Bronze to Iron Age. Thus, it would seem that there was no Roman period temple in the area. However, as the archaeological evidence presented below indicates, the date can be revised and the presence of a Roman temple at Timna that could be equated with *Ad Dianam* is a distinct possibility.

First noticed in Rothenberg's survey of the Timna area, the site, initially termed Site 200, shed great light on Late Bronze Age Egyptian control of the mines and subsequent Midianite/Iron Age religious processes. A relatively small site, 10 x 6m, with a smaller *naos* set against the back of the structure, it was located beneath a cliff in the middle of extensive copper mines (see Figure 26, page 341). The main phases of the site belong to the Late Bronze Age when the Egyptians mined the area and later in the Iron Age when Midianite tribes moved into the area. The site had been heavily disturbed and as the stratigraphy was only 1–1.5m deep there was damage right down to the earliest deposits.

However, there appears to have been a Roman occupation of the site (termed Stratum I in Rothenberg's stratigraphic sequence) evident in the shell of the building. Rothenberg dismissed this phase as one of post-building use by squatters or "treasure hunters" (*ibid.* 81). Gichon's analysis of the Classical pottery (*ibid.* 253–260) found that there were mainly Roman first to second century wares which contained no diagnostic Nabataean pottery. However, within the corpus were several lamps (*ibid.* 256–257, Nos. 14–18), which suggests use within a covered structure rather than open squatter occupation. While Rothenberg maintains a post-building Roman phase, his description of the occurrence of some Roman pottery is indeed strange:

"..the Roman occupation was at a much deeper level in the middle as compared with the edge of the mound (near the temple walls) and evidently there was still a considerable depression in the middle of the mound in Roman times. This would explain the occasional Roman sherd in the soft sand layer much below the actual Roman occupation horizon, often together with Egyptian New Kingdom material" (*ibid.* 55).

Either Rothenberg failed to distinguish the later Roman intrusion sufficiently to minimise stratigraphic contamination, or else he misunderstood the true Roman occupation of the

temple site. However, even if one allows a more sedentary Roman occupation of the building, there is no evidence that it was religious in nature. At most, one could posit a more definite Roman use than the original excavator allowed. However, there was a clear religious entity associated with the area, the memory of which may have lasted until the Classical period.

### *Aelia* to *Rababatora* (Jerusalem to Er Rabba)

The *Tabula Peutingeriana* shows a main route across the northern part of the Wadi Arabah near the Dead Sea. The route leads from a junction of the *Aelia* (Jerusalem) to *Elusa* (Khirbat El Khalasa) road (probably around modern Hebron) and leads to *Mampsis* (Kurnub) where it crosses the Wadi Arabah and passes *Zoora* (As Safi) on its way up the Wadi 'Isal where it meets the *via nova Traiana*. The route then leads up to *Rababatora* (Er Rabba) which is a main stopping place on the *via nova Traiana* from *Philadephia* to *Aila* (modern Amman to Aqaba). The route in question is drawn on Sheet VIII (Figure 22, page 337) of the *Tabula Peutingeriana* as *Hierusalem–Thamaro–Rababatora*. The distances and identification of these sites have been given in Table 3 (page 342). Identifications with a question mark are those being newly proposed in this study, while all scholars accept the rest. On the Israeli side this route was known as the Ascent of the Scorpions and was surveyed by Harel (1959). On the Jordanian side Mittmann (1982) and Jacobs (1983) carried out surveys of the Roman road that led from the Ghor up the Wadi 'Isal to join the *via nova Traiana* at Kathrabba.

The terminus of this route is *Rababatora*, which seems to be a corruption of two place names – Er Rabba and Betora (Bowersock 1983, 175) – of which the latter became a major legionary base (See Parker 1986a, 1987a). *Rababatora* is not listed in Ptolemy. The site has been correctly located as modern Er Rabba, which is equated with the biblical *Rabbatmoab*, a major administrative town on the Moab plateau. This name was mentioned in the Babatha Archive, where Babatha registered her census return with a military officer in AD 127 (Lewis 1989, 66; *P. Yadin* 16, 11). The name changed, probably during the Severan period, to Areopolis when coinage of that name was minted by the city (Spijkerman 1978, 299).

Thus, given the importance of *Rababatora*, the route as detailed in the *Tabula Peutingeriana* must represent a main crossing over the Arabah. However, Finkelstein, following Aharoni (see below), put the site of *Thamaro* at Ain Hosb and concluded that this route marked on the *Tabula Peutingeriana* was of secondary importance, and that the route from Jerusalem to Aqaba was the main route that joined the *via nova Traiana* on the Plateau. Finkelstein (1979, 31) pointed out that the shortest route was up Wadi Dahal past Qasr Tlah to the area around Buseirah on the Jordanian Plateau. This is indeed the shortest route across the Wadi Arabah

at this point if one is heading towards the Jordanian Plateau, and numerous Classical sites have been traced along the route by DAS (see Chapter 6). However, Finkelstein's view of the route rests on commonsensical assumptions regarding the nature of the *Tabula Peutingeriana*. He assumed it detailed connections between roads but it seems more likely that, as drawn on the map, it shows the links between major towns.

In this regard, the location of *Thamaro* is of some importance as a stopping place on this route and is more pertinent to this study as a military location. This site was detailed in Eusebius' entry in the *Onomasticon* and in the *Notitia Dignitatum* and Beer Sheva Edict (see below). Eusebius (*Onom.* 8, 6–9) places Θαμαρα (Thamara) as one day's journey from *Mampsis* on the *Hebron* (El Khalil) to *Aila* (Aqaba) road. The site was shown on the Madaba Map but, as will be shown below, the accuracy of this location is spurious. *Thamaro* was initially, after some exploration by Alt in the 1930's, agreed to be the site of Qasr Al Juheiniye (Alt 1935) which is situated 18km east of Kurnub in the northern Negev mountains. Rothenberg (1971) places the ancient settlement of *Thamaro*, which only Eusebius mentions, at Ain Al Arus (En Tamar). Cohen excavated the site and found two large courtyard structures dating to the Nabataean and Roman periods (Cohen 1984b). However, Aharoni (1963), relying on Eusebius' later description of the site, places it at Ain Hosb in the Wadi Arabah as this would seem a more commonsensical location for a road down to Aqaba (Figure 24, page 340). *Thamaro* is listed in Ptolemy as Θαμάρω (see Table 1 page 331) with a latitude of 30° 50'. This is on the same latitude as Μαψ (*Mampsis*, Kurnub) and Ἐλούσα (*Elusa*, Khirbat El Khalasa). This would roughly fit with the position of *Thamaro,* located within the eastern Negev hills at Qasr Al Juheiniye as described by Alt. Ain Hosb lies some 30km to the south-east of Kurnub (*Mampsis*) and thus does not tally with Ptolemy's evidence.

The distance from *Aelia* (Jerusalem) to *Thamaro* is given as 53 Roman miles but this is neither the distance to Ain Hosb nor to Qasr Al Juheiniye. It is commonly understood that it refers to a junction of the *Aelia* to *Elusa* road, probably around modern El Khalil (Hebron) (see Figure 19, page 334). Aharoni (1963, 36) places it around Khirbat Tatrit but this seems too close to Beersheva where no ancient junction has been noted (Tsafrir *et al* 1994, 240). This location may have been put forward to tie in with his view that the road headed further south to *Aila* (Aqaba). If one accepts the Hebron junction, then the distance to Qasr Al Juheiniye matches the 53 Roman miles listed in the *Tabula Peutingeriana*. In this case, scholars like Aharoni (1963) and Finkelstein (1979) are at fault in their methodology when they compare evidence from different periods without securing the synchronic and textual

context of the document. The only secure evidence that can be compared across periods is Ptolemy's list of co-ordinates.

### *Philadelphia* to *Haila* (Amman to Aqaba)

The final route listed in the *Tabula Peutingeriana* for *Arabia* is one of the major roads in the province and follows the line of the *via nova Traiana* established by Trajan just after the annexation of AD 106. All the sites (bar one which will be discussed below) along the route have been located and are well established in academic discourse. Bowersock (1983), while discussing the maps of Roman Arabia, provided an overall summary of the route and the site locations. The route starts at modern Amman and then leads south to Er Rabba (discussed above) where it continues to a site, *Thornia,* which has been identified as either At Tuwanah or in the Dana region. It then passes Shaubak and onwards to Petra. From Petra it goes south-east towards Es Sadaqa and dips off the edge of the Jordanian Plateau to Humayma. It then goes past the archaeological site of Khirbat Khalde and then dips down to Aqaba. The route is also that of the older King's Highway (Graf 1995). The route in question is drawn on Sheet VIII (Figure 22, page 337) of the *Tabula Peutingeriana* as *Philadelphia–Rababatora–Thornia–Negla–Petris–Zadagatta–Haurra–Praesidio–Ad Dianam–Aila.* The distance between *Rababatora* and *Thornia* and *Negla* are not listed and thus the exact location of *Thornia* is unknown. The distances and identification of the other sites have been given in Table 4 (page 342). The archaeological surveys of this route are treated in Chapters 4 and 6.

There is a clear error in the *Tabula Peutingeriana* in that the road after *Praesidio* leads down to *Ad Dianam.* As was discussed above, the latter site could either be identified as modern Yotvata or, as suggested here, the mines of Timna. While there are tracks that lead to this area of the Arabah from the Hisma plateau, they do not start after the site of Khirbat Khalde (*Praesidio*). As the archaeological evidence makes clear, the *via nova Traiana* leads directly to Aqaba (*Aila*). One should note that *Praesidio* (*Praesidium*) is usually termed a police post and is equated with the Greek φρυριον (Isaac 1992, 174–5). The archaeological evidence from Khirbat Khalde clearly matches the textual evidence as there is only one small fort in the area with a *caravanserai* nearby (Kennedy 2000, 187–190).

The only other problem on this route is the location of *Thornia.* It is listed in Ptolemy as Θάνα and is on the same latitude (30° 30') as Ζοάρα (*Zoara,* As-Safi), Εβοδα (*Eboda,* 'Abda), Μαλιάτθα (*Maliattha,* Ain Hosb?) and Καλγουϊα (*Kalgouia,* Qasr Tlah). The latitude of Ζοάρα (*Zoara,* As Safi) has some problems, as it should be roughly on the same level as *Elusa, Mampsis* and *Thamaro* (30° 50'). However, if the locations of the other sites are correct, as argued above, then the identification of *Thornia* as At Tuwanah, made by

Bowersock on the basis of a philological correlation, is probably correct (Bowersock 1983, 175). Fiema has shown that the site was a major town during the Nabatatean and Roman periods (Fiema 1993). However, one should note the modern place name, Dana (or Dhana), which bears some similarity to Ptolemy's Θάνα (Hart 1986a, 340). The village lies 12km to the south-west of At Tuwanah in an area that contains major Classical sites (see Chapter 6).

## Eusebius' *Onomasticon*

Περί των τοπικων όνοματων των έν τή θεία γραφή (On the Place-Names in the Holy Scripture) was written by Eusebius, who lived between *c.* AD 260 and 339. Now conveniently known as the *Onomasticon*, the work is a gazetteer of Biblical place-names correlated with contemporary names of the late third/early fourth century. The work is of the utmost importance to the geography of ancient Palestine and sections of Arabia. The original text is in Greek but a later (*c.* AD 390) Latin translation was made by Jerome. Both texts have been used in the best edition of Eusebius' work by Klostermann (1904), although it is not without certain problems (see Nestle 1905). Thomsen (1903) produced the first major study of the texts which laid the foundations of subsequent site identification and geographical knowledge. Of relevance to the present study, Thomsen (1903, 162–163) listed 10 military site locations, to which Barnes (1981, 338 note 18) added one other. These are listed here as Table 5 (page 342).

### Date of composition and validity of information

As Eusebius, in his introduction, had referred to himself as Bishop of Caesarea, it was thought that the *Onomasticon* dated to *c.* AD 330 (Klostermann 1904, ix–x). Barnes, however, argued persuasively for a far earlier date of post-AD 293 (Barnes 1975 & 1981, 110–111). For military and political studies the importance of Eusebius' text lies in the description of provincial changes that lay at the heart of the Diocletianic reforms of the Eastern Empire at the end of the third century. In particular, it first documents the dissolution of the province of Arabia when the territories of the Negev and south of the Wadi Hasa became part of the new province of *Palaestina Salutaris* (Tsafrir 1986). Thus, Eusebius' descriptions of military locations are highly important in that they represent part of Diocletian's new military dispositions as he reorganised whole Eastern Empire.

Isaac (1998, 284–309 which is a revision of Isaac 1996) recently contended that Eusebius had access to official records which, linked to the date of the texts, would make his location of military garrisons more significant. Following Noth (1943), Isaac noted that Eusebius usually tries to locate a site in relation to the main road network. Also, he assumed that

Eusebius, as Bishop of Caesarea, would have access to official records. However, this would mean that the early date of composition would stretch to the AD 330s which would slightly negate the significance of the provincial changes and legionary movements.

Isaac maintains that Eusebius' descriptions of sites show knowledge of three aspects of the Roman province (Isaac 1998, 293): public roads, garrisons and city territories. However, as Barnes (1981, 108–109) noted, this is not only official knowledge as Roman garrisons and roads were known to all. This debate has not progressed much further from the initial studies of Thomsen (1903, 1906), who agreed with Klostermann (1904) that official documents were used. Against this, Kubitschek (1905) argued that the information was not presented with sufficient regularity to be based on official information. For example, he (*ibid.* 125) noted that many entries had their mileage measured from Eleutheropolis (Beit Jibrin), which was not a major town. Fischer (1932) provides an overview of the sort of geographical documents that Eusebius may have used but does not get any closer to a firm conclusion regarding Eusebius's choice of sources. Although the matter cannot be solved satisfactorily, Barnes (1981, 109) noted that while many of the entries prefix such information with "is shown to this day", this does not preclude either a personal visit, second-hand knowledge from an informant or official/literary documents.

### Site identification

The identification of sites listed in Table 5 (page 342) are, for the most part, well known and were recorded as such by Thomsen where he linked them with entries in the later *Notitia Dignitatum* (1903, 162). Although the location of Θαμαρα (Thamara) is problematic, the reasons for identifying it with Qasr Al Juheiniye have been argued above in the *Tabula Peutingeriana* section on the Jerusalem to Er Rabba route. Most military sites in the *Onomasticon* are described as either φρυριον or *praesidium,* which usually denotes a military post on a road with a policing function (Isaac 1992, 174). Μηφαάθ (Umm Er Rasas) in the Dhiban Plateau in Jordan (see Kennedy 2000, 130–132) and Ἀφεχα (Afiq) in the Golan (Tsafrir *et al* 1994, 64) are clearly outside the geographical area of the study and will not be discussed further. Apart from the three examples discussed below, the remaining site locations are well known (Figure 27, page 344).

#### *Θαιμαν (Thaiman)*

The military presence at Θαιμαν (*Thaiman*) was called ἐγχαθηται, a garrison, which may distinguish it from the normal φρυριον or *praesidium* discussed above. It is either placed 15 or five Roman miles from Petra in an un-noted direction. Avi-Yonah (1976, 101), noting that

it was near a χώμη (translated in the Klostermann text as *villa* although the Greek could also refer to a village), suggested that the military site was intimately associated with an estate around the villa. This led him to suggest an equation with the later attested imperial estate *Saltus Hieraticus* noted by George of Cyprus (Honigmann 1939, 43 44). Further, Seeck (1876) linked this site with the later *Notitia Dignitatum* entry of *Thamana* and this has been followed by many scholars (Bowersock 1983, 175 & 180; Fiema 1991, 304). However, Seeck was not correct to equate it with *Thornia* of the *Tabula Peutingeriana* and Θάνα/Θοανα (*Thana/Thoana*) of Ptolemy (Bowersock 1983, 175 note 27). Nevertheless, Bowersock endorses (1983, 175 note 27 & 180 note 45) the equation of *Thamana* with Θαιμαν (*Thaiman*) and this is followed by Fiema (1991, 299 and note 28).

In Biblical scholarship Θαιμαν (*Thaiman*) is known as the land of the Temanites and denotes an area rather than a location (MacDonald 2000a, 192–193). More specifically, Glueck (1935, 82–83) placed it at Tawilan, a site near Petra. Edelman (1995) places Teman around *Bozrah* (modern Buseirah) while Simons (1959, 90), following Lagrange (1897, 217) places it around Shaubak. None of these locations have been fully verified and, as an area designation, the name is usually thought to be in the southern area of Edom (de Vaux 1969, 379–385). In this study the equation of *Thamana* with Θαμαρα (*Thamara*) is followed but the reasons for this are outlined in the section on the *Notitia Dignitatum*. If this equation is followed then Θαιμαν (*Thaiman*) should clearly be considered a separate site somewhere in the area between Shaubak and the Dana area.

### *Ροωβώθ (Rooboth)*

Eusebius equated the biblical site of Rehoboth of the River (*Genesis* 36.37; 1 *Chronicles* 1.48) with Ροωβώθ (*Rooboth*) in Γεβαληνή (*Gebalena*, Jibal area). As a toponym, the word means a "spacious, broad place" (MacDonald 2000, 191). Thus, many have sought to place this site on the lower slopes of the Wadi Hasa in the Khirbat/Ain Rihab area (see Bartlett 1989, 50–51). However similar the names appear, there has been no indication of a military site there, nor have any scholars questioned the location of such a site in the area to the west of the *via nova Traiana* and away from any major route. Graf (1979, 124), following Hartmann (1913, 184), places Ροωβώθ (*Rooboth*) at Khirbat Ruwath, just to the west of modern Gharandal, which is located on the King's Highway route near the head routes that lead down to the Wadi Arabah. However, there has been no indication of military archaeological remains (Walmsley 1998, Walmsley *et al* 1999). However, most scholars still place the location at Khirbat Ruwath (Kennedy 2000, 156–158; Isaac 1998, 461; Fiema 1991, 298)

### *Καρχα (Carcaria)*

Καρχα (*Carcaria*), the last site in this section, is described by Eusebius as a *castellum* situated one day's journey from Petra. In the absence of any other textual corroboration for the location of the site, the distance is of little help as a day's journey could vary depending on the mode of transport. Although it is probably between 20 to 30km a day (see Glueck 1934, 1935; Frank 1934 for distances travelled in one day in this landscape), if one draws an approximate circle around Petra this does cover a large area. Καρχα (*Carcaria*) has been equated with the later *Notitia Dignitatum* entry of *Sabure sive Veterocaria (ND Or. 34, 28)* and is located somewhere in the Wadi Sabra to the south-west of Petra. Here, Hartmann (1913, 184–185) noted that the latter part of *Sabure sive Veterocarie* may contain the ending of *Carcaria*. He further noted the similarity in name between *Sabure* and the modern Wadi Sabra, 6.5km outside Petra (Musil 1907/08 II/1 128; Glueck 1935, 80–81), which contains Classical remains although they have not been fully investigated (Lindner 1986, 151–154). This has been followed by other scholars (Alt 1935, 26; Abel 1933 I, 184; Fiema 1991, 303; Kennedy 2000, 173).

### Sites with later attested garrisons

Eusebius also listed five sites that did contain later garrisons (known from the later *Notitia Dignitatum* and the Beer Sheva edict) but he did not mention any military presence. These are listed in Table 6 (page 343). The one to two hundred year gaps between these texts would initially suggest that the absence or presence of garrisons, reflecting actual diachronic variation of military location, is not surprising. However, as was argued in Chapter 2 the historically attested military pressures in *Arabia/Palaestina Tertia* over this period were not sufficient to account for wide variation in military deployment. Thus, it is suggested here that military variation is quite conservative. However, the terse nature of the gazetteer framework precludes any lengthy discussion of sites.

### Transfer of the 10th Legion to *Aila*

The short entry in Eusebius noting that Αιλαμ (*Aila,* modern Aqaba) is where the 10th Legion was stationed is the only historical evidence for this major change in the province's military dispositions (Millar 1993, 175). If one accepts Barnes' *c.* AD 293 date for Eusebius' text (see above), this change presumably had taken place before the beginning of the fourth century. The legion is known as the *X Fretensis* and had previously been based in Jerusalem. Most scholars assume that this change occurred during Diocletian's reign (Brünnow & von Domaszewski 1909, 275; Hoffmann 1969, Vol 1 232) although Graf suggested that this

might have occurred earlier under Aurelian (Graf 1978, 19). The change has traditionally been seen as reflecting a degree of threat from nomadic tribes (Parker 1986a, 137–143). It is difficult to assess this as the level of military force in Aila before this time is unknown (Kennedy 2000, 195). However, there is historical evidence of a campaign against the Saracens by Diocletian (Parker 1986a, 136), which Barnes has dated to AD 290 (Barnes 1982, 51), and which has been used by Parker to put these changes in context. Graf has countered this by suggesting that this shows the campaign in *Arabia* was really only a large construction project (Graf 1997a, 123–124). As was noted in Chapter 2 and has been emphasised by Isaac (1992, 77), nomadic incursions and raids before the end of the fourth century did not pose any real threat to Roman security.

However, the transfer of a legion is a major strategic movement. The reasons for this transfer have been inadequately traced and explanations are usually based on two areas: one, the nomadic threat and, two, the Persian wars that were active in the north during this period (Millar 1993, 176–180). While Graf (1997a) has shown that the nomadic campaign is a misreading of the evidence for Arabia, it is not clear why a legion would be transferred to this area to act as strategic support for troops much further north in Syria.

Around AD 300, King Shammar Yuharish united all the kingdoms of southern Arabia, an event of considerable importance in the political history of Arabia. Unfortunately, evidence of this event is difficult to confirm (Shahid 1970, 6), but such a strategic threat would likely have provoked a response from Rome. Similarly, Shahid noted that around AD 326, Shapur II (Shahid 1984b, 66–68) conducted a campaign in Arabia against local elements. Again, the presence of a legion "*in extremis finibus Palaestinae*" (remotest part of Palestine), as Eusebius terms it (*Onom.* 6, 17; 8, 3), does make much more sense in the context of major military and political events in southern Arabia. However, the problematic dating of Eusebius' text discussed above, and the lack of more contemporary evidence, means that a secure historical reconstruction cannot be made. What is notable is that Shahid's observations have not been touched upon at all by Limes scholars in the somewhat myopic debates over nomadic strength.

### The *Notitia Dignitatum*

The *Notitia Dignitatum* is a text that lists, along with illustrations, the civil and military branches of the Empire at the end of the fourth and beginning of the fifth century. As a document it is one of the most important tools for the analysis of military dispositions and provincial administration in the Late Roman Empire. It is divided so as to list the civil offices, military leaders and units with locations in the eastern and western sections of the

empire respectively. Unfortunately, it is the only document of this sort in the Empire and its textual context is problematic. No other texts survive from antiquity except for a single Carolingian copy (Reeve 1983). The modern edition used by most scholars is Seeck's (1876).

### Date of composition and validity of information

Most scholars have used the *Notitia Dignitatum* to reconstruct the military framework of the Empire (Jones 1964, III 348–380; Hoffmann 1969). However, recent studies stress that it may be a more literary text which presents an idealised view of the Empire at a time when its military strength was low (Brennan 1995). This view was endorsed by Kulikowski (2000, 360) but he maintained that information within the document is still composed of historical facts. Moreover, earlier scholars (*e.g.* Bury 1920, 131) recognised that the document is probably derived from various sources of the imperial government. What is clear is the date of composition of the eastern document, which Kulikowski puts at between AD 386 and May AD 394 (2000, 372).

Hoffmann's approach (1969), while arguing persuasively for the reconstruction of troop movements, was based on certain assumptions that have been questioned by Kulikowski, who objects to an "archaeology of troop movements" (2000, 371). In fact, Cameron warns against an overuse of the list as it may exclude many federate troops (Cameron 1993, 51). Further, scholars have used the *Notitia Dignitatum* to analyse the Diocletianic military reforms of a hundred years earlier (Parker 1986a). Such considerations are secondary to the main analysis of this section.

The major problem with using the *Notitia Dignitatum* to locate sites is that it does not possess geographical information. There are illustrative passages at the top of each section, which apparently show the locations of each site in relation to each other and a major geographical feature (in the case of this study, the River Jordan). Unfortunately, as the maps are only reproduced schematically in Seeck's 1876 edition, they are not realistic (Dilke 1985, 167–169) and cannot be used in any analysis. Site location must, therefore, be determined by reference to other sources. However, it must be emphasised that the *Notitia Dignitatum*, although probably compiled from diverse sources, should be regarded as a unified document. Some scholars have tried, unsuccesfully, to use the order of sites (as they have done for the Beer Sheva Edict, *e.g.* Fiema 1991) to establish some geographical order, but it is clear that it was stratified by unit seniority.

## Previous analyses

Beginning with Seeck's 1876 edition of the *Notitia Dignitatum*, attempts have been made to locate all of the units listed. In southern Jordan and Israel the area is covered by the *Notitia Oriens* 34, *Dux Palaestinae,* which is listed in Table 7 (page 345). The modern locations of places listed in Table 7 are presented in Figure 28 (page 346). After Seeck's edition there were several attempts to locate sites by scholars who had carried out research in the area (Vailhé 1898–1899; von Domaszewski 1898; Brünnow 1909). However, the most comprehensive treatments were by Thomsen (1906) and Hartmann (1913) who could also compare the list with known names from other sources, and to which Abel (1933, 178–184) provided a later overview.

## A reinterpretation

In this study, the movements of specific units are not important, as it is the location of these units that provide the most important data for a reconstruction of the military landscape. The sections of the *Notitia Dignitatum* listing military personnel contained in the research area are, in the eastern sections, *Notitia Oriens* 37, *Dux Arabiae* and *Notitia Oriens* 34, *Dux Palaestinae*. However, as nearly all of the Arabian province listings are outside the study area only specific references will be made to this list. Although, as noted above, a full reconstruction of the overall military structure cannot be achieved with the data from the *Notitia Dignitatum*, one can assume that the locations of all the units listed are command centres and have a regional strategic value.

Of the 30 sites listed, 17 can be identified with some degree of certainty. However, it is difficult to provide a secure location for the remaining 13 sites. Of these, six can be located with a degree of certainty (*ND Or.* 34, 23, *Sabaiae*; 27, *Robathae*; 28, *Sabure sive Veterocariae*; 29, *Moahile*; 43, *Calamona*; 45, *Moleatha*) while four more may be assigned a general area (*ND Or.* 34, 38, *Afro*; 39, *Cartha*; 40, *Tarba*; 42, *Iehibo*). The final three have no secure location (*ND Or.* 34, 32, *Asuada*; 36, *Hasta*; 37, *Ala Idiota constituta*).

## Accepted and re-evaluated military site locations

Although 17 out of the 30 listed sites have secure locations, on the basis of the analysis in this study four of these sites have been re-evaluated. These are *Apud Praesidium*, *Praesidio*, *Arieldela* and *Thamana*. At the root of the problem is the application of incorrect methodology where archaeological, textual and toponymic evidence has been correlated before consistency is shown. *Apud Praesidium* was thought to be Qasr Fayfa in the Wadi Arabah, but *Praesidio*, as was clearly shown in the *Tabula Peutingeriana*, is the site of

Khirbat El Khalde, which is located on the Jordanian Plateau in the Hisma area. Parker (1979, 178) put forward the view that the two sites are located nearby, but most scholars favoured the previous attribution and this is now accepted (Kennedy 2000, 202–203).

### *Apud Praesidium*

The correlation of ancient *Apud Praesidium* with Qasr Fayfa was based on an entry in the Madaba Map which had a site named Πρασιδιν (*Prasidin* = *Praesidium*) located at the top of the Wadi Arabah near the southern tip of the Dead Sea. This site has long been equated with Qasr Fayfa (Donner 1992, 69) on the Jordanian side of the Wadi Arabah. However, as will be discussed in the section on the Madaba Map, this is not a secure identification. The archaeological remains first noted by Frank (1934, 210–211) in the Ghor Al Fayfa showed two large rectangular structures 500m apart (Kennedy 2000, 204 Fig. 20.12). Alt, using Frank's evidence and the evidence of a similar listing in the province of Arabia (see below), suggested that the two structures represented these military establishments in the Ghor Al Fayfa. This has been followed by Abel (1933, I 181), Bowersock (1983, 182), Fiema (1991, 298) and Kennedy (2000, 20–-203). However, as is shown in Chapter 4, this archaeological interpretation by Alt is incorrect and one of the rectangular structures is most probably a reservoir and the other a fort. Thus, the archaeological evidence cannot sustain the textual correlation of two sites situated close together.

Two entries appear within the list for Arabia: *ND Or.* 37, 30, *Ala secunda felix Valentiniana, apud Adtitha* and *ND Or.* 37, 31, *Cohors prima miliaria Thracum, Adtitha. Adtitha* has long been equated with the site of *Hatita* from the *Tabula Peutingeriana* and is now accepted as the site of Khirbat Samra (Bowersock 1983, 176). A fort and village have been excavated over a number of years (Humbert & Desreumaux 1998). Most scholars would place *apud Adttitha* somewhere in the vicinity of this site (Kennedy 2000, 98). Within the same Arabian list is the entry *ND Or.* 37, 35, *Cohors tertia Alpinorum, apud Arnona.* The location is a site near the Wadi Mujib, which is called Arnon in the Bible *(e.g. Numbers* 21, 13) and Ἀρνών in Eusebius (*Onom.* 10, 15–24; 11, 13–23). In this instance, *apud* does not refer to a site within the document but to a well-known geographical feature. The name *Praesidium* does not appear during the period of the *Notitia Dignitatum* as a location in the northern Wadi Arabah. Therefore, the correct methodology is to seek the companion site within the same document. It is unclear why this logic was applied by scholars to the location of *apud Adttitha* but not to *Apud Praesidium.* Thus the suggestion by Parker (1979, 178) that it is more logical to assume that *Apud Praesidium* is linked to *Praesidium* is indeed correct. As *Praesidium* is securely identified as Khirbat Khalde (from the *Tabula*

*Peutingeriana)* then *Apud Praesidium* is either Khirbat Quweira or Khirbat Kithara (see Chapter 4).

### *Arieldela*

A similar confusion has also allowed the location of *ND Or.* 34, 44, *Cohors secunda Galatarum, Arieldela* to be placed in the southern Wadi Arabah at Khirbat Gharandal where there are remains of a fort (Kennedy 2000, 197–199). The identification was made on the basis of the philological similarity between the Arabic Gharandal and the ancient name (Hartman 1913, 190). However, there also exists a Khirbat Gharandal (and also a modern village of the same name) located further to the north-east on the Plateau, near the modern town of Buseirah. This site has some considerable Classical archaeological remains (Walmsley 1998). In the later Beer Sheva Edict (see below), two names are listed, Ἀριδδήλα and Ἀρινδήλω, which suggests that there were two sites of this similar name. One was identified with Gharandal in the Wadi Arabah and the other on the Plateau. This has been followed by all scholars (Bowersock 1983, 181; Fiema 1991, 296). However, as will be demonstrated in the section on the Beer Sheva Edict below, these three names all refer to the one site – Khirbat Gharandal on the Plateau.

### *Thamana*

It is also accepted by all scholars that the entry *ND Or.* 34, 46, *Cohors quarta Palaestinorum, Thamana* is probably equated with Θαιμαν (*Thaiman*), as discussed in the entry on Eusebius above, and may be located around the Dana area in Jordan (Bowersock 1983, 180; Fiema 1991, 299). Bowersock (*ibid.)* negated Seeck's suggestion (1876 (1962, 74), which was followed by Hartmann (1913, 188), that *Thamana* (and Θαιμαν (*Thaiman*)) was the same as *Thornia* of the *Tabula Peutingeriana* and Ptolemy's Θάνα/Θοανα (*Thana/Thoana*). However, this study, like Thomsen (Thomsen 1906, 124), favours the equation of *Thamana* with the site of *Thamaro*, which was first listed in Ptolemy's *Geography* (see Table 1, page 331). Perhaps a similar process in Latin transliteration of Greek/local names is evident in the change of Βηρσαβεέ in Eusebius (*Onom.* 50, 3) to *Benosabae* in the *Notitia Dignitatum* (*ND Or.* 34, 18).

### *Cohors secunda Cretensis, iuxta Iordanem fluvium*

One further site whose location, but not name, is well known is the entry *ND Or.* 34, 47, *Cohors secunda Cretensis, iuxta Iordanem fluvium*, "near to the River Jordan". This site also appears in the Beer Sheva Edict as απο του Ιορδανου (near the River Jordan Ins. III, Frag. I, VIII). However, the representation of a tower on the Madaba Map next to what is probably a

bridge over the Jordan near its outlet at the Dead Sea (Figure 29, page 347) is a more important indicator of its location. This was probably located on the main ancient road from Jericho that went across the Jordan Valley and up to the ancient site of *Esbus* (modern Tall Hesban) where it met the *via nova Traiana*.

### Uncertain locations

There are six uncertain locations discussed in this section. Some can be treated fully while others depend on the ancillary analysis of other documents, especially the later Beer Sheva Edict. The location of both *ND Or.* 34, 23, *Equites promoti indigenae, Sabaiae* and *ND Or.* 34, 28, *Equites primi felices [Palaestini], Sabure sive Veterocariae,* depends on equations with entries in the Beer Sheva Edict and will be discussed in that section, as will the location of *ND Or.* 34, 27, *Equites sagittari indigenae, Robathae.*

The entry *ND Or.* 34, 45, *Cohors prima Flavia, Moleatha,* has long been equated with the Ptolemy entry of Μαλιάτθα (*Maliattha*) (Hartmann 1913, 188; Abel 1933, 180). This was thought to equate with Eusebius' Μαλααθα (*Malaatha*), which is fairly securely identified with Tel El Milh in Israel (*Onom.* 14, 3). However, as was shown in the section on Ptolemy, the geographical location, when plotted, is clearly further to the south of Tel el Milh and is probably located at Ain Hosb. This, nevertheless, creates several problems. In the Beer Sheva Edict there is a site, Μωα (*Moa*) (Inscription 2, Frag. V) which is equated with a site on the Madaba Map with the same name and is clearly located in the Wadi Arabah. Μωα (*Moa*) has always been equated with another entry in the *ND Or.* 34, 29, *Equites sagittarii indigenae, Moahile* (Abel 1933, I 181, Bowersock 1983, 183), which is always assumed to have been located in the Wadi Arabah (Gutwein 1981, 331). In this study, greater reliance is placed on the locations plotted by Ptolemy, thus the location of Μωα (*Moa*) is equated with Μαλιάτθα (*Maliattha*) and thus *Moleatha.* As will be shown in the section on the Beer Sheva Edict, *Moahile* is not in the Wadi Arabah and should be equated with Eusebius' Μαλααθα.

The final site of uncertain location – *ND Or.* 34, 43, *Cohors prima equitata, Calamona* – has been equated with a biblical entry. As Abel points out (Abel 1933, 182), it may be linked to the biblical name *Zalmonah* (*Numbers* 33.41–42) which is known as a camping place of the Israelites on their Exodus. It is placed between Mount Hor (location unknown) and Punon (Wadi Faynan area). Abel (*ibid.*) places the site to the west of Qasr Tlah, but this seems too far north. Avi-Yonah (1976, 45) suggested that Bir Madhkur could be a more suitable location as there is a Roman fort and *caravanserai* there (Kennedy 2000, 201). Certainly, today, it is the most practical camping place before Faynan. MacDonald (2000a, 83), following Davies (1979, 90), finds this unconvincing and cites archaeological material

derived from Glueck (1935, 35–37) to show that there was no Iron Age material to support such a claim. However, MacDonald could have cited more up to date surveys, such as King (1985, 1987; King *et al* 1983, 1987, 1989) or Smith (Smith & Niemi 1994), to support his claim that there was no Iron Age pottery in this area. Neverthless, it does not necessarily follow that a Roman site and an Iron Age camping ground would be in the same place.

### Sites with area location only

The following four sites can only be assigned to a general area with varying degrees of accuracy. The first is *ND Or.*34, 40, *Cohors prima argentenaria, Tarba.* Alt (1935, 26, note 1) provided the first secure location when he suggested that *Tarba* may be corrected to *Garba* and thus identified with a modern village site, Jarba, which is located 2km to the north of Udhruh. While this is plausible, it remains unclear, when there is no listing for the known military site of Udhruh, why a unit would be stationed in this small village (for archaeological remains see Killick 1986, 438). This small site is just to the north of the main spring and settlement, although Killick (1987, 30) has noted a fort in the area. It is possible that there may be some name shift or a confusion of names in the transmission of documents. However, if one accepts the *Tarba*–Jarba correlation, it is probably safe to accept that the unit was stationed somewhere in the Udhruh area.

The following three locations, *ND Or.* 34, 38, *Cohors duodecima Valeria, Afro*; *ND Or.* 34, 39, *Cohors decima Carthaginensis, Cartha;* and *ND Or.* 34, 42, *Cohors secunda Gratiana, Iehibo*, have been correlated with entries in the later Beer Sheva Edict. On the basis of arguments presented in the next section on the Beer Sheva Edict, they will be shown to be located somewhere in the Wadi Arabah. *Iehibo* had already been thought to be in the Wadi Arabah (see Abel 1933, 181) but the other two are presumed to be on the Jordanian Plateau. *Afro* has usually been located, on the basis of linguistic similarity (and the order of the Beer Sheva Edict but this will be discussed below), in the north-west area of the Jibal near the Wadi Hasa (see Fiema 1991, 295 and note 4 for full bibliographic details). *Cartha* does not appear to have any topynomic similarity but it has been equated with the Beer Sheva Edict entry of *Sirtha* and represents a deformed transmission of the name (Hartmann 1913, 187). As such, it was equated with the similar Arabic name of Sirre, a village to the north of Tafilah (Abel 1933, I 183). Fiema accepts this and presents other parallels in the same area (Fiema 1991, 296, note 11). However, as will be shown in the Beer Sheva Edict section, both are actually located in the Wadi Arabah area.

### Sites with no secure location

As was noted above, three sites have no secure location: *ND Or.* 34, 32, *Asuada*; 36, *Hasta;* and 37, *Ala Idiota constituta. Asuada* has been identified with Khirbat Samra, a site close to Khirbat Faynan (Abel 1933, 181), based on the assumption that the name contains the Arabic *aswad,* meaning black. However, this is not a secure derivation and the site of Khirbat Samra (or Khirbat Nahas), identified by Frank (1934, 218–219) is a clear Iron Age site (Fritz 1996). Abel has identified Hasta as a site to the north of Khirbat Faynan in the Wadi Hassiya (Abel 1933 I, 181). However, this site – Khirbat Hassiya – is a small *caravanserai* and does not conform to the standardised fort plans of the Roman period (Frank 1934, 215). The last site in this section is the entry *ND Or.* 34, 37, *Ala Idiota constituta.* This is a clear clerk's or copyist's error. The text can be corrected to read as *Ala prima Diota constituta,* but this does not help secure the location or identification of the unit itself, which is not known from other sources. Hartmann (1913, 186–187) suggested an equation with the Imperial Estate of Constantine mentioned by George of Cyprus (Honigmann 1939). Alt (1953) and Castritius (1992) continued these themes but reached no overall conclusion.

## Beer Sheva Edict

The Beer Sheva Edict is the name given by modern scholars to a collection of inscriptions found in the village of Beer Sheva, now in southern Israel (Arabic Bir Es Seba), during the early part of the twentieth century. Probably fragments of several imperial edicts, its date is uncertain and could be from the early fifth to early sixth century. It consists of lists of place names next to amounts of money to be paid to the local imperial government. Eight fragments were found and reported on between 1903 to 1920 in *Revue Biblique* and have now been grouped into five main texts (No. 1: Abel 1909; No. 2: Clermont-Ganneau 1906b; No. 3: Vincent 1903, Abel 1920(b); No. 4: Abel 1903, Savignac 1904, Clermont-Ganneau (1906a); No. 5: Abel 1920(a)).

### Previous analyses

Apart from the preliminary reports, the earliest attempt to analyse the data from the Beer Sheva Edict was by Hartmann (1913, 189–192). He immediately saw the connection with the *Notitia Dignitatum* which had many of the same names. Alt (1921) published four of these fragments (Nos. 1–4) with a short commentary, and this has become the standard work to cite when discussing these inscriptions. As Isaac (1998, 451, Note 61) has noted, this has had some impact on subsequent discussions (*e.g.* Mayerson 1986a) which have all ignored fragment No. 5 and the comments in the original *Revue Biblique* articles. Abel (1933, 1938)

provided another overview of the data. All discussions of these fragments are predicated on the assumption that they are contemporary, purely because of the similarity in style and form of the writing, as it was clearly carved by several hands (Abel 1920a, 123). The names on the lists have been tabulated in Table 8 (page 348) and the locations are presented in Figure 30 (page 350).

## Date of composition

As has been shown by van Berchem (1952, 33–36) the monetary amounts contained in the lists represent the tax paid by soldiers to the provincial government, and therefore the place names are military unit sites. Thus, the Beer Sheva Edict is vitally important to our undertsanding of the distribution and size of troop formations in *Palaestina Tertia* in the period following the *Notitia Dignitatum* which, in turn, makes dating the inscription very important. van Berchem (*ibid.*) noted that the tax returns made by troops were fixed at a certain rate in AD 443 (citing Theodosius, *Nov. xxiiii* 2 of Sept. 12 AD 443). At the same time it was stipulated that Saracen allied tribes were exempt from this tax. Inscription 4 mentions (Abel 1903; Savignac 1904) a tribal chief of an imperial domain with a listing for a tax receipt. Thus, van Berchem concluded the date of the Beer Sheva inscriptions could not be later than AD 443. However, Mayerson (1986a) argued at some length for the date to be AD 536. He relates these inscriptions to the Novel 103 issued by Justinian in his change of the government structure in *Palaestina* (*C. Iust.*1.27.1) (Mayerson 1986b, 1988). While Mayerson argues convincingly for this date, he seemed to be unaware of the discussion by van Berchem (1952) and so relied solely on Alt's 1920 work on the inscriptions. Thus, he fails to mention Inscription 5 (Abel 1920a, 123 Fragment VII) where the names of two consuls are apparently listed. Abel (1920a, 124) provided a date range for two consuls with these names of AD 521–534. This date range would have secured Mayerson's argument for an early sixth century date. Abel's new date range for the Edict is followed in this work, allowing the presentation, for the first time, of a reasonably clear picture of military formations one hundred years later than the listing in the *Notitia Dignitatum*.

## A new interpretation

The Edict contains sites only from the province of *Palaestina Tertia* and it has long been recognised that these lists were arranged geographically by region. The fragment numbers are listed in the order established in *Revue Biblique* 1906, 412, which was followed by Alt (1921). Inscription 1 contains sites probably from the Negev area, although two sites are not known (Ασοα and Άσουδα). However, Zoopα (as Safi) is clearly in the Wadi Arabah area. Inscription 2 contains all sites on the Jordanian Plateau and all sites in the Wadi Arabah.

Inscription 3 seems to contain sites in Judaea and the Kerak Plateau. Inscription 4 is a list of sites from all over the province and seems concerned with estates (*e.g.* Σαλτων Κωνσταντιανιχης) or imperial lands.

In addition, Inscription 2 orders the sites by level of taxation (see Table 9, page 349; Beer Sheva Edict, Inscription 2, Fragment V), and has always merited more attention due to its completeness. Fiema (1991, 207) noted that the sites were arranged in three areas: the region between Aila and Petra (Nos. 1–7); the Jibal area (Nos. 8–17) and the Kerak region (No. 18). However, this approach is misguided and a new ordering of sites is presented here.

In fact, site Nos. 1–4 clearly belong to the Petra area, but there is no mention of the known military sites in the Wadi Arabah (apart from As Safi mentioned in Inscription 1). However, six of the sites (Nos. 9, 12, 13, 14, 15, 16, 17) clearly belong to the Wadi Arabah region or have been generally assigned there. Thus it would seem more acceptable to arrange the list into three regions: Nos. 1–7 belong to the Jordanian Plateau; Nos. 8–17 belong to the Wadi Arabah area; and No. 18, Αιναναθα (*Ainauatha*), belongs to the Kerak plateau area. This new ordering of sites has radical implications for the location of key military sites in the area and illuminates the military importance of the Wadi Arabah area. The following discussion of sites is therefore broken down into these main geographical units. There then follows a brief overview of the rest of the sites that lie in northern Jordan, northern Israel and Palestine.

### Sites reassigned to Jordanian Plateau

#### Ἀριδδήλα (Ariddela)

On the basis of the above reordering, within the first group of sites (Nos. 1–7) three should be reassigned to the Jordanian Plateau area. The first site (Inscription 2, Line 5) is Ἀριδδήλα (*Ariddela*) which has usually been identified with Khirbat Gharandal in the Wadi Arabah (see Fiema 1991, 296). In Inscription 4 there is an entry ?οριου Ἀρινδήλων (in the territory of Arindela) which is usually located as Gharandal near Buiserah on the Jordanian Plateau. Although the spelling is slightly different Ἀριδδήλα (*Ariddela*) is usually equated with the entry in *ND Or.* 34, 44, *Cohors secunda Galatarum, Arieldela.* George of Cyprus and Hierocles list a site in Palestina III Ἀρινδήλα that is meant to be Gharandal near Buseirah (Honigmann 1939). In Line 7 of Inscription 2 there is an entry Σοβαεια οριου Ἀριδ[δήλων] which is taken to mean *Sobaeia* in the territory of *Ariddela.* In this instance, Ariddela is Khirbat Gharandal. However, other entries in the Beer Sheva Edict, when noting territorial locations, are referred to as being within a larger city/town region, *e.g.* ?οριου Πετρων,

Inscription 4, Frag. II, III, IV. No places in Inscription 2 are referred to as being within the territory of a military location unless they are stationed in the town and approximated to extant political/city limits. This observation tends to suggest that Σοβαεια (*Sobaeia*) would be in the territory of a pre-existing larger town rather than in the limits of a military location.

As will be explored in Chapter 4, Khirbat Gharandal in the Wadi Arabah was primarily a military location and there is no hint of a larger civilian presence (Kennedy 2000, 197–199). If one accepts this, and the new ordering of sites discussed above, then Ἀριδδήλα (*Ariddeła*) (and thus Σοβαεια, *Sobaeia*) should be located on the Plateau. If this is the case, then Ἀριδδήλα (*Ariddela*) may be a variant spelling of Ἀρινδήλα (*Arindela*) which would firmly place it at Gharandal near Buseriah. One must also note that ?οριου Ἀρινδήλων was found in a separate block, Inscription 4, and variant spellings may be expected when there were clearly different hands involved in the carving process. Furthermore, these variant spellings of the same site are also equated with the entry of *ND Or.* 34, 44, *Cohors secunda Galatarum, Arieldela*, which is now Gharandal near Buseirah.

### Καρκαρια *(Carcaria)*

Site No. 6 Καρκαρια (*Carcaria*), known from Eusebius (see Table 5, page 342), has been equated with *ND Or.* 34, 28, *Equites primi felices Palaestini, Sabure sive Veterocariae* (for reasons see the Eusebius section above). The site was described by Eusebius as a *castellum* situated one day's journey from Petra. It has traditionally been placed somewhere in the area of Wadi Sabra, which is about 7km to the south-west of Petra. The site contains a small theatre, a Nabataean settlement and a mining centre. No large military site has been reported (Kennedy 2000, 173, Glueck 1935, 80–81, Lindner 1986, 151–154).

However, Eusebius also related that the site of *Thamaro* was one day's journey from *Mampsis* (*Onom.* 8, 8). If this site is Qasr Al Juheiniye then the distance is only 20km. Nineteenth/early twentieth-century travellers usually accomplished 30km in a day over good ground (see distances in Frank 1934). Thus, the site of Wadi Sabra seems too close to Petra to match Eusebius' location. But a day's march may be a relative expression and thus any attempt at an exact calculation is impossible. However, as Isaac (1996) made clear, Eusebius always referenced sites by their relation to major roads. As he did not do this with Καρκαρια, one may assume it was not on a constructed road. The only major known military site in this area, which is clearly situated well away from the main routes, is Khirbat Qirana. The site is located 5km south-east of the Ras En Naqb and lies on the edge of the Plateau overlooking the Hisma (see Figure 30, page 350). Although not fully explored, there are clear indications

of a large fort and an associated settlement dates to the Classical period (Kennedy 2000, 177–178). The site is fully discussed in Chapter 4.

## Sites reassigned to the Wadi Arabah

### Ροβαθα *(Robatha)*

The assumption that the second group of sites in Inscription 2 (Nos. 8–17) belong in the Wadi Arabah allows radical new interpretations of site location. The most radical change is the location of site No. 8, Ροβαθα (*Robatha*). As was noted in the discussion of sites listed by Eusebius, he noted that Ροωβώθ (*Rooboth*) was in Γεβαληνή (*Gebalena,* modern Jibal). Thus Fiema (1991, 298) followed earlier scholars by locating the site at Khirbat Ruwath near Gharandal. This site has not produced any evidence of a military site (Walmsley 1998).

However, if one accepts that it is a site within the Wadi Arabah it now becomes the first site in that region paying a large 43 *solidi* in taxes. This is comparable to Humayma, which comprised a large fort *c.* 220 x 150m, although Humayma may not have been occupied during the early sixth century (Oleson *et al* 1999). One must, therefore, look for a large fort in the Jibal area of the Wadi Arabah. However, whether this part of the Wadi Arabah was considered to be in Γεβαληνή (*Gebalena,* modern Jibal) during this period is unclear. If it was, then the fort must be located on the Jordanian side of the Wadi Arabah somewhere to the north of the Wadi Faynan (which was probably the boundary of Jibal if one assumes a line from the plain of the Tawil Ifjeij on the Plateau – see Figure 30, page 350), and before As Safi on the line of the Wadi Hasa (the traditional line for the end of the Jibal region).

This means that only two sites could be considered as possible locations for Ροβαθα (*Robatha*): Qasr Tlah and Qasr Fayfa. Of these, Qasr Tlah is securely identified as Τολοανα (*Toloana*) at No. 14 of the Beer Sheva Edict (see next section). Qasr Fayfa, however, has two clear large rectangular structures tentatively dated to the Classical period, although they have not been properly surveyed since the 1930s (Frank 1934, 210–211; Glueck 1935, 9–10; 1939, 147). Additionally, the location of the site on a broad wadi plain may be of significance when one considers the meaning of the word Rehoboth (*Genesis* 36, 37) in the Bible. As a toponym, the word means a "spacious, broad place" (MacDonald 2000a, 191). Qasr Fayfa has previously been identified as *Praesidium* (No. 16 on the Beer Sheva Edict) and linked with *Prasidin* of the Madaba Map. However, as will be shown in the section on the Madaba Map, this attribution is wrong and based on a faulty reading of the archaeological evidence and the Madaba Map.

### Ἔλλεβανα *(Ellebana)*

Of the remaining sites, both Φαινων (*Phaino,* Khirbat Faynan) and Τολοανα (*Toloana,* Qasr Tlah) are well known and the locations are secure. Site No. 9, Ἔλλεβανα (*Ellebana*), is unknown but Alt (1935, 26) proposed that it be equated with the entry of *ND Or.* 34, 43, *Cohors prima equitata, Calamona.* While the argument is not secure, it is accepted here as the evidence points to being in the Wadi Arabah. Also, *Calamona* was seen as a variant of the biblical *Zalmonah* which, as was noted above, was probably located to the south of Wadi Faynan at Bir Madhkur. However, this does present a problem for the theory of site location offered in this study. The reconstruction of evidence in the analysis of the *Tabula Peutingeriana* and Ptolemy suggests that Bir Madhkur was Λύσα (*Lysa*) in Ptolemy and *Lysa* in the *Tabula Peutingeriana.* While changes in name are common during the Roman period when site names were "latinised", it is unclear why a local name, Λύσα (*Lysa*), would be transformed into biblically inspired *Calamona,* and then further transformed into Greek as Ἔλλεβανα (*Ellebana*).

### Uncertain locations

There are three further sites in this section that cannot be assigned a location: No. 10, Ἄφρο (*Aphro*); No. 11, Σιρθα (*Sirtha*); and No. 15, Ἔισειβα (*Eiseiba*). Each site has been equated with an entry in the *Notitia Dignitatum.* Ἄφρο (*Aphro*) with *ND Or.* 34, 38, *Cohors duodecima Valeria, Afro* (Hartman 1913,187); Σιρθα (*Sirtha*) with *ND Or.* 34, 39, *Cohors decima Carthaginensis, Cartha* (Hartmann 1913, 187); and Ἔισειβα (*Eiseiba*) with *ND Or.* 34, 42, *Cohors secunda Gratiana, Iehibo* (Alt 1921, 10). However, if one allows that all major military sites in the Wadi Arabah, barring As Safi and Al Aqaba, have been located as discussed above, then the following sites have not been assigned an ancient name: Khirbat Gharandal, Yotvata and Qal'aat Umm Quseir (Moyat Awad).

### Sites in the Negev

The Negev sites are listed mainly on Inscription 1. However, if it is accepted that the Beer Sheva Edict is organised by geographical area, the listing of As Safi in Inscription 1 presents some difficulties for the reconstruction discussed above. With such a geographical framework, it is unclear why As Safi would be placed in the Negev area. There is no corroborative evidence to solve this problem. The remaining sites are Μάμψις? (*Mampsis,* Kurnub), Ελουσα (*Elousa,* Khalasa), Ασοα (*Asoa,* unknown), Ἄσουδα (*Asouda,* unknown) and a reference to an imperial estate, Σαλτων? . The first two entries are well known as the sites of Khalasa and Kurnub, which apparently are not listed in the preceding *Notitia*

*Dignitatum*. However, Ἀσουδα (*Asouda*, unknown) is equated with the *Notitia Dignitatum* entry of *ND Or.* 34, 32, *Asuada*. As was noted above, *Asouda* has been identified with Khirbat Samra in theWadi Arabah (Abel 1933, 181). However, given the overwhelming evidence from Inscription 2, it seems unlikely that further names are found in this area. Ασοα (*Asoa*, unknown) has not yet been found, while the imperial estate has no reference to an area.

### Sites in the Israel/Palestine and Kerak Plateau area

Sites in the Kerak Plateau and northern Israel/Palestine are mentioned in Inscription 3 and are located in the northern areas of the province. These seem to be in northern Israel and the West Bank and the Kerak Plateau in Jordan. Of the 14 sites mentioned only four cannot be identified: Αβαδ? (*Abad*?), Αδαρα (*Adara*), Αειν?(*Aein?*) and Φτεου? (*Fteou?*), all of which could be in the Jordanian Plateau area rather than in Israel/Palestine. Of the rest, four are in Jordan: Αρέοπολις (*Areopolis*, Er Rabba), Αρνωνασ (*Arnonas*, Wadi Mujib area), Βητοωρο (*Betoro*, El Lejjun) and *[τού πραιτω]ριου Μοβηνων* (Qasr Bshir). The remaining six are in Israel/Palestine: Αιλια (*Ailia*, Jerusalem), Διοχαισαρειας (*Dioceserae*, Saffuriye), Γισχαλα (*Gishala*, Jish), απο του Ιορδανου (near the River Jordan), Νεον Καστρν (*Neon Kastron*, Qala'at ed Damm?) and Σεβασατης (*Sebasta*, Sebastiya).

Three of the four Jordanian sites are mentioned in the *Notitia Dignitatum* in the *Dux Arabiae* as *ND Or.* 37, 17, *Equites Mauri Illyriciani, Areopoli* (Er Rabba); *ND Or.* 37, 34, *Cohors tertia felix Arabum, in ripa Uade Afaris fluuii in castris Arnonensibus* (in the area of Wadi Mujib); and *ND Or.* 37, 22, *Praefectus legionis quartae Martiae, Betthoro* (El Lejjun). The last Jordanian site *[τού πραιτω]ριου Μοβηνων* is probably Qasr Bshir, a Roman fort 15km north of El Lejjun where a complete entrance inscription has a reference to "Castra Praetorii Mobeni". The fort was built in the third to fourth century and was occupied until the fifth century (Kennedy 2000, 140–143).

Of the six sites in modern Israel/Palestine three appeared in the *Notitia Dignitatum*: Αιλια (*Ailia*, Jerusalem) = *ND Or.* 34, 21, *Equites Mauri Illyriciani, Aeliae* (Jerusalem); Νεον Καστρν (*Neon Kastron*, Qala'at ed Damm?) = *ND Or.* 34, 48, *Cohors prima salutaria, inter Aeliam et Hierichunta* (also called Μαληδομνεί, *Maledomnei* in *Onom.* 24, 10; 25, 10); and απο του Ιορδανου = *ND Or.* 34, 47, *Cohors secunda Cretensis, iuxta Iordanem fluvium*. The last site has no known location but the Madaba Map shows a tower near a bridge over the River Jordan at the mouth of the Dead Sea. The remaining three sites are further to the north and seem to have no military presence in the *Notitia Dignitatum*. Διοχαισαρειας (*Dioceserae*, Saffuriye) is the site of Sepphoris in Lower Galilee. Thomsen (1906) proposed that this site

could be equated with the *Notitia Dignitatum* site of *ND Or.* 34, 28, *Equities primi felices (sagittarii indigenae) Palaestinae, Sabure sive Veterocariae.* This is followed in Tsafrir *et al* (1994, 227) but the alternate equation of *Sabure* with Khirbat Qirana is followed here. Γισχαλα (*Gishala,* Jish) is the site of modern Israeli Gush Halav in Upper Galilee; while Σεβασατης (*Sebasta,* Sebastiya) is the biblical site of Samara, modern Sebaste, the main city of the Samarian hills.

### Imperial lands and estates

There are six entries in the Beer Sheva Edict relating to estates and territories. Inscription 4 seems to be concerned mainly with estates (Σαλτον) and lands. However, in Inscription 1 there is a reference to a Σαλτον. In Inscription 4, there are two references to Imperial estates, one of which is named Σαλτων Κωνσταντιανιχης (*Salton Konstantianes*). This estate is also mentioned later by George of Cyprus (Honigmann 1939, 1026). There are also two references to the territory of a specific area: ?οριου Πετρων and ?οριου Ἀρινδήλων (in the territory of Petra and in the territory of *Arindela* (Gharandal)). The last site to be mentioned in Inscription 4 is Τερεβινθος (*Terebinthos*). This is known as the site of the tent of Abraham where the famous oak grew (*Genesis* 18.1). During the Classical period it was famous as a market place where Jews were sold into slavery by the Emperor Hadrian. Around AD 330 the Emperor Constantine built a basilica here and it is located on the Madaba Map (Donner 1992, 61). This imperial connection and inclusion in the Beer Sheva Edict suggests that it was within the imperial house. The connection of the military with imperial lands is more fully developed in Chapter 8.

## Nessana Papyri

During excavations at the site of Auja El Hafir (modern Israeli Nessana) in the 1940s, a group of important papyri were found which date to the sixth century (Kraemer 1958). The site is a large settlement in the southern Negev on the border of the Sinai which began under the Nabataeans and flourished through to the Byzantine period (Colt 1962). While most of the papyri recovered deal with matters of trade etc., one papyrus (*P. Colt* 39) dealt with tax returns. The document lists the names of nine sites with taxable rate and the tax to be paid. The document was arranged so similarly to the Beer Sheva Edict that the two were instantly seen as roughly comtemporary. This document has been discussed by Casson (1952), Kraemer (1958, 119–125), Mayerson (1986a) and Isaac (1998, 452–458), who have focussed on the nature of the tax returns.

However, for this study, it is sufficient to note the location (see Figure 31, page 352) of the sites mentioned and these are presented in Table 10 (page 351). In the main place-names list, in Table 11 (page 355), the site names have been transliterated to differentiate them from the Beer Sheva Edict ones. The Nessana sites have been placed in the same column as the Beer Sheva entries since the date is probably the same. The sites are all known and present no problems of attribution. Two are new to this study. They are the sites of *Nessana* (Auja El Hafir) and *Sobila* (Khirbat Az Zubala), the latter being located in the northern Negev. It is also represented on the Madaba Map (Donner 1992, 73). Neither has textual attestion of an earlier military presence. The remaining seven sites all have a previous military presence. Of these, *Oboda* was known from Ptolemy and the *Tabula Peutingeriana*. *Mampsis* was in the Beer Sheva Edict Inscripiton 1, while *Elusa* is mentioned in Ptolemy, the *Tabula Peutingeriana* and Beer Sheva Inscription 1. *Birosaba, Birsamis, Chermula* and *Malaatha* are all known from the *Notitia Dignitatum* to contain military units (see Table 7, page 345).

### Madaba Map

The Madaba Map is a large mosaic map of Byzantine Palestine which was found in a church in Madaba, Jordan, in 1884 (Donner 1992, 11). Although badly damaged, enough survives to present an important view of the late Byzantine landscape of Palestine, parts of Jordan, and Egypt. The map was probably created during the reign of the Emperor Justinian (AD 527–565), which would make it broadly contemporary with the Beer Sheva Edict and the Nessana Papyri (*P. Colt* 39) discussed above. In this study, the Donner (1992) edition of the Map was used and the relevant sections are produced as Figure 32 (page 353). The Map was probably used to highlight the Biblical sites and broadly follows the tradition of Eusebius' *Onomasticon* regarding the location and naming of sites. However, the topographical representations are limited and serve to highlight the Christian view of the world, with Jerusalem at the centre of the Map representing the centre of the world. This section will not attempt an overview of the Map but will concentrate on the location of three forts depicted on it. They are shown as a line of stations south of the Dead Sea to the south of an area termed ερημ (desert), which is the northern area of the Wadi Arabah (Figure 33, page 354). These are (from south to north): Μωα (*Moa*), Θαμαρα (*Thamara*) and Πῤασιδιν (*Prasidin* = *Praesidium*).

#### Μωα *(Moa)*

To the west of this line of forts is the large town of Μαμψις (*Mampsis*, Kurnub) which appears to be situated between the mountain chain of the Negev hills. This led Donner (1992, 67) to speculate that it represented the Ascent of the Scorpions of the Old Testament (*e.g.*

*Numbers* 34.4), which has been surveyed by Harel (1959). If this is so, the gap between the mountains points to a route leading to Μωα (*Moa*), the most southern of the three posts, and one could postulate that Μωα (*Moa*) is Ain Hosb. This would link well with the earlier argument in the Ptolemy section that Μαλιάτθα (*Maliattha*) was Ain Hosb and thus *Moa* is linked to *Moleatha* of the *Notitia Dignitatum.*

However, many Israeli scholars have chosen to see Μωα (*Moa*) as a site on the Gaza–Petra road at Moye 'Awad which is 32km to the south of Ain Hosb (Cohen 1982b, 242). However, one should also note the legend to the south-east of Μωα (*Moa*), reading Ἐρήμ[ος ἐνθα/ὁπου] τους Ἰσραηλιτας ἐσωσεν (?) ὁ χαλκους ὁφις. This is translated as "the wilderness where the serpent of brass saved (?) the Israelites" (Donner 1992, 43). The text is from *Numbers* (21, 6–9) and relates a story from the Exodus Itineraries where Moses put up a bronze snake on a pole to save the people from venomous snakes. Aharoni (1979, 204) pointed out that the Hebrew for serpent is "nahash", which may equate with the site Khirbat Nahas, near Khirbat Faynan, in an area of extensive copper mines. Thus, if the text refers to an area around the Wadi Faynan area then Μωα (*Moa*) is clearly to the north-west of this, which again strengthens its identification with Ain Hosb.

### Θαμαρα *(Thamara)*

If Μωα (*Moa*) is Ain Hosb then the next site to the north, Θαμαρα (*Thamara*), should be along the east side of the Wadi Arabah. Mittmann (1977, 228–232) places it at Ain Al Arus. Alt (1935, 34–5) placed it at Qasr el Juheiniye where a large fort was found in the eastern Negev hills (Frank 1934, 257–259). Rothenberg (1971, 215) noted two large square buildings at Ain Al Arus which dated to the Classical period and there were remains of a Classical settlement. Cohen (1984b, 201) noted that as part of excavations carried out there in 1982, both structures have a courtyard layout with no towers. The dating seems to suggest a Nabataean/Early Roman occupation. Cohen refers to the second square structure (20 x 20m), that lay on a hill called Giv'at Hawwar, as a "fort?". However, it appears this may be due to its location on a hill rather than any military architecture or diagnostic finds. However, one should note again the earlier discussion on the *Tabula Peutingeriana* where the exact distance from Hebron places the site at Qasr El Juheiniye.

### Πρασιδιν *(Prasidin)*

The last site in the line is Πρασιδιν (*Prasidin*), which means *Praesidium*, a police post. It is either located to the north of Ain Al Arus or Qasr El Juheiniye. A possible candidate is Qasr Ez Zuweira (modern Mezad Zohar), described as a "Roman fort" (Tsafrir *et al* 1994, 186),

situated 5km south of En Boqeq. The site has not been properly surveyed and no detailed plan or description exists. The location of Qasr Ez Zuweira is difficult to reconcile with the Madaba Map as it is situated to the north-west of the Dead Sea, whereas Πρασιδιν is clearly to the south of the Dead Sea. Other scholars (Abel 1933 I, 182; Bowersock 1983, 182) have suggested that Πρασιδιν is Qasr Fayfa but this has been discounted in the section on the *Notitia Dignitatum*. The location of the site on the Madaba Map, on the evidence presented in this study, clearly suggests that it is on the west side of the Wadi Arabah.

### Other possible military locations

In addition to the Madaba Map representations of the three forts above, it has been suggested that a military camp is shown in the representation of Βηροσσαβα (Beer Sheva) (Donner 1992, 70). Here, a rectangular walled encampment may be shown (Figure 34, page 354) but equally it could refer to a colonnaded street and church. The only other reference to an official entity is the entry for Gerar: Γεραρα.....ένθα τό Γεραριτικον σάλτον; Gerar...where the saltus (estate) Gerariticus is (Donner 1992, 71). Unfortunately, the location of this imperial estate is unclear. However, Schaefer (1979, 66–83) places the location of this estate at Orda, which is probably Khirbat Jamma.

## Conclusion

The analysis of textual documents shown in Table 11 (page 355), over the whole 500-year span of Roman rule clearly demonstrates a conservative tradition of military location. Of the 30 sites listed in the military list of the *Notitia Dignitatum*, 10 were listed in Ptolemy and seven in the *Tabula Peutingeriana*. Their correlation with the 24 sites in the Beer Sheva Edict (now known to be over a hundred years later) is particularly strong. Of the 12 sites listed by George of Cyprus, nine are listed in the *Notitia Dignitatum*. Of the 16 sites listed in this section of the *Tabula Peutingeriana* for the study area, 11 are known from the *Notitia Dignitatum*.

The results of this study demonstrate that Ptolemy's list of sites in the southern Levant referred to the main route being in the Wadi Arabah and not, as most scholars thought, to a route in the southern Negev. This new discovery has clear implications for the later correlation of this route with military locations and provides a deeper chronological framework than previousiy thought. Also, if the correlation of sites such as Καλγουϊα (Kalguia) with Khirbat Tlah holds, then it dramatically extends the textual evidence for such sites. However, while Ptolemy's co-ordinates can roughly pinpoint sites, it is only with the data obtained from the *Tabula Peutingeriana* that the above observations hold true.

The exact distances contained in the *Tabula Peutingeriana* allow the radical new identification of the sites along the *Aelia* (Jerusalem) to *Aila* (Aqaba) route. Furthermore, the common attribution of *Ad Dianam* with Yotvata cannot stand and a new correlation with Timna is demonstrated. This newly textually attested route clearly associates this line of sites with archaeologically attested military sites. The evidence from the *Aelia* (Jerusalem) to *Rababatora* (Er Rabba) route clearly shows the route crosses the Ascent of the Scorpions at *Thamaro* (Qasr El Juheiniye). More importantly, the evidence from the *Tabula Peutingeriana* has clear implications for military locations in this area. The comparison of *Tabula Peutingeriana* locations with later attested military sites shows a high degree of correlation. As the *Tabula Peutingeriana* is primarily a road map of the Empire, it graphically serves to highlight the importance of military locations in this area and the strong connection between the two.

While evidence from the *Onomasticon* of military locations allows new identifications, such as the correlation of Khirbat Qirana with Καρχαρια being put forward here, it is difficult to ascertain the overall nature of the military locations. As Table 6 (page 343) makes clear, Eusebius mentions sites that contained later garrisons but he did not refer to a presence himself. As the above debate on the nature of his wider geographical information (*i.e.* did he have access to official information?) seems incapable of resolution, the framework of his military identifications is equally unclear. It can only have value when compared with other periods. However, the idea proposed here, that the relocation of the *X Fretensis* was in response to strategic threats from southern Arabia, allows for a much wider historical explanation than unsubstantiated references to nomadic threats.

However, the analysis of Ptolemy's maps, the *Tabula Peutingeriana* and Eusebius' locations allows a fresh interpretation of many of the military locations noted in the *Notitia Dignitatum*. The resulting redistribution of sites clearly links the known sites to three main communication routes – one main route in the Wadi Arabah and two routes across the Negev. The first route goes through the Ascent of the Scorpions towards Mampsis to Tel el Milh. The second route skirts the north of the Negev area as it goes through Beersheva towards Gaza. It is unclear if the main Petra–Gaza route was a military one. There is a further main route from Tel Milh heading north towards Jerusalem and then across the Ghor towards Philadelphia (Amman). In Jordan, apart from the Wadi Arabah route, most of the military locations on the Plateau are associated with the length of the *via nova Traiana*. However, north of Sadaqa the sites of Udhruh and Dajaniyah are to the east of the *via nova Traiana*. Nevertheless, apart from the garrison at Gharandal, there seems little correlation

with large settlements, which suggests there was no pattern of military locations for internal control.

The overall pattern of locations seen in the *Notitia Dignitatum* continues in the Beer Sheva Edict sites of a hundred years later. A new interpretation of Inscription 2 of the Beer Sheva Edict postulates a completely different ordering of site locations, which in turn allows their fresh correlation with the sites in the *Notitia Dignitatum* and other documents. While some sites are reassigned here, it is clear that they still continued to correlate with major communication routes. Also, it is clear, as Isaac noted (1998, 453), that there was a movement of military resources to smaller sites in the Negev, which is noted in the Nessana Papyri. Sites such as *Nessana* and *Sobila* were occupied during this period. However, this is not the case on the Jordanian Plateau or in the Wadi Arabah where site location seems to have remained the same. However, apart from Humayma, all sites seem to have ceased in the Hisma area. The Beer Sheva Edict also clearly established the link between military sites and imperial lands, which was also confirmed by references in the Madaba Map. The only area where there is significant change is in the north-east area of southern Jordan. Here, from the period of the *Notitia Dignitatum* (*c.* AD 400), there is a clear extension of military sites to the east. However, the precise date and nature of this development remains unclear, and the sites cannot be correlated with known routes from the *Tabula Peutingeriana.*

This fresh interpretation of military site location in southern Jordan and Israel highlights the inappropriate methodology used by earlier scholars to identify sites. Too often the internal consistency of the document was not fully established before the location was correlated with other textual or archaeological data. However, when analysed carefully as demonstrated, these texts, which span nearly the complete period of Roman rule in the southern Levant, clearly illustrate the official Roman landscape of routes, forts and large imperial units such as estates. Moreover, the development of this imperial infrastructure does not vary through this period and suggests a highly conservative tradition of change.

# Chapter 4

## Review of military site location: archaeological evidence

### Introduction

This chapter is a critical review of the existing dataset of archaeological sites classed as Roman forts. It demonstrates that evidence of the distribution and development of Roman forts has been poorly interpreted. By reviewing the material by sub-region, using a strict methodology to attribute military function, a more limited range of sites will be proposed. These sites, when compared with the textual evidence of the previous chapter, will clearly show that military distribution, both spatial and temporal, is more conservative than previously believed.

### Research background

Previous interpretations of military location in southern Jordan have continually advanced the concept of linear defence of the desert frontier in all periods of Roman rule (Parker 1986a). This was contested by Fiema (1995) who noted that Parker did not analyse most of the military sites behind the supposed frontier line of desert sites. Kennedy (1992) first noted this in his review of Parker's (1986a) work where he criticised Parker's assumption that military sites behind the frontier did not merit further discussion. This was followed up by Graf (1997a, 1997b) who demonstrated that much of Parker's pattern of frontier defence is based on a poor evaluation of the archaeological dataset.

However, to date there has never been a thorough review of military sites in southern Jordan that fully discussed location and span of site use. Previous reviews of military sites concentrated on forts with securely dated inscriptions to act as type sites (*e.g.* Gregory 1997) or were intended as a gazetteer of sites as an academic resource (Kennedy 2000). These types of study are usually rooted in an architectural appreciation of forts leading towards a typology of sites to act as broad dating tool (Kennedy & Riley 1990; Parker 1995; Lander 1984). As such, these discussions do not focus sufficiently on archaeological dating methods to reconstruct a temporal picture of forts. Moreover, the spatial awareness of military sites is usually limited to a local tactical appreciation of the fort (Parker 1986a) or views sites as dots on maps linked by typological connections (Gregory 1997).

The only purely archaeological survey of military sites in southern Jordan was carried out by Fiema (1995), that built on his earlier PhD study (Fiema 1991). He noted a correlation with

military control and general communication routes that had not been emphasised by Parker. He also noted the severe problems with the ceramic dating methods and the lack of textual data relating to military locations in the period. He concluded that many of Parker's assumptions about military distribution and development were highly questionable. Unfortunately, the format of his study precluded any lengthy review of military sites, no doubt because it intended to demonstrate the conclusions of his PhD – that military location was linked to control of trade routes. As was shown in Chapter 2, this assumption is flawed and based on an over-correlation of ceramic phasing with an assumed imperial pattern of control. Thus, Fiema included some sites, mainly from data from the Wadi Hasa Survey (MacDonald 1988), that fitted his model of military distribution correlating with overall settlement pattern. As will be shown below many of these sites should not be termed military sites.

However, the identification of such sites in the archaeological record has always been a matter of debate. Isaac (1992) pointed out the fallacy of assuming that every major building in a frontier zone is a military one. Gregory's (1997) mammoth study of Roman military sites on the eastern frontier has led to a rigorous re-evaluation of the data set, which provides a basis for more precise interpretations of military systems. Although Parker (1995), and Kennedy & Riley (1990) established a broad typology of Roman military sites, Gregory pointed out that many sites may have had different functions belying their military appearance, *e.g.* Qasr Tilah (Gregory 1996, 190). Furthermore, she points out that a site like Aseikhin – a substantial building of rectangular plan around a courtyard – is assumed to have a military character solely because of its geographical position (Gregory 1996, 189–190). Using this kind of methodology, similar sites, such as Al Hammam (Parker 1986a, 101 Fig. 45) and Al Mutrab (Parker 1986a, 103 Fig. 46), have been included in most studies of military sites (*e.g.* Kennedy 2000, 174–176). Similarly, many Iron Age scholars have tended to assign a military function on the basis of "square-ness" and location (*e.g.* Hart & Falkner 1985) backed up by biblical evidence (Glueck 1934, 1935, 1939) (Findlater 2002, 139).

The lack of a comprehensive review of military sites greatly hinders an effective reconstruction of the overall military distribution patterns through time and space. By critically evaluating all sites classed as Roman forts in southern Jordan and the Wadi Arabah, it is believed that a secure database of military sites can successfully be used to analyse the spatial and temporal development of the Roman military in southern Jordan. The method of inquiry is by descriptive analysis. This review seeks to demonstrate the hypothesis that military settlement patterns exhibit specific variation to assume a correlation with known

historical and socio-economic patterns. It will test the following three interpretations. Can one see the installation of Roman power in the landscape and does this pattern of sites develop throughout the Roman period to meet the nomadic threats as argued by Parker (1986a, 1997a)? Does fort location correlate with known centres of settlement suggesting that internal security was the dominant factor (Isaac 1992)? Finally, does the distribution of sites correlate with trade routes (Fiema 1991)?

Therefore, this chapter will analyse and correlate the archaeological data to reconstruct the spatial and temporal patterns of military location. It will concentrate on: (1) establishing if site morphology can be termed military; (2) establishing site size; (3) establishing archaeological date for occupation and (4) critically reviewing previously interpreted site associations, *e.g.* lines of defence or monitoring systems etc. Once correlated, the evidence can be compared with the textual evidence from Chapter 3 to build up a balanced picture of military distribution.

The discussion of each site will follow a fairly standard outline where the location of the site is briefly stated followed by a brief overview of previous work that has classed the site as military. There will then follow a more detailed discussion of the interpretation of occupation for the site and, where necessary, a discussion of salient problems with site interpretation. The list of sites reviewed are presented in Figure 36 (page 357). The geographical sample range of these sites begins in the Kerak Plateau (from the Er Rabba area) down to Aqaba and Wadi Arabah (see Figure 35, page 356). The main geographical areas of this region will divide the chapter: Kerak Plateau, Jibal, Shera'a, Hisma and, finally, the Wadi Arabah.

## A reinterpretation of sites on the Kerak Plateau

### Er Rabba

Though clearly important as one of the centres in the province of Arabia (Bowersock 1983, 88), Rabbathmoab (now called Er Rabba) has no military archaeological remains. The Babatha Archive testifies to the presence of a cavalry officer in AD 127 who received Babatha's census return (Lewis 1989, 65–70 *P. Yadin* 16; also Cotton 1997). The only other reference to a military presence is the entry in the *Notitia Dignitatum* for *Equites Mauri Illyriciani, Areopoli* (*ND Or.* 37.17). *Areopolis* was the name given to Rabbathmoab from the later Roman period onwards (Spijkerman 1978). The town acted as a mustering point for Byzantine soldiers massing against the early Islamic invasions (Kaegi 1992, 83–87). However, of note is its position on the *via nova Traiana* These admittedly brief references

may point to the long-term presence of Roman garrisons, but without archaeological data one cannot speculate; and therefore Er Rabba cannot be included in this archaeological analysis.

### El Lejjun

About 15km to the south-east of Er Rabba is the massive military site of El Lejjun (Figure 37, page 358). Excavated by Parker as part of his Limes Arabicus Project, it represents the only extensively excavated Roman military site in the south of Jordan (Parker 1987a, 1988, 1990, 1991). The site is situated 12km east of the *via nova Traiana* and 15km from the modern Desert Highway and the town of Al Qatrana. Traces of extensive extra-mural settlement were located in the east, west and south areas, including a large courtyard building (35 x 25m), interpreted as a *mansio*, and a temple structure set within a colonnaded courtyard (Parker 1987a, 385–398). The site was occupied extensively throughout prehistoric and Islamic periods due to the large spring that is situated 450m west of the fort. A large early Bronze Age settlement is located to the west of the fort.

Constructed of massive walls 2.5m wide, and with 24 massive towers ringing the walls, covering an area 247 x 190m, the excavator (as indeed all authorities do) considers the main site to be a legionary base. Therefore, it has been correlated with the *Notitia Dignitatum* entry *Praefectus legionis quartae Martiae, Betthoro* (*ND Or.* 37.22). This is the only mention of such a legion in the sources (Kennedy 1980; Speidel 1977). The excavation suggests a construction date of around AD 300 and final abandonment (following extensive rebuilding after earthquake damage of AD 363) around AD 550. Nabataean period ceramics were also present on the site but appear not be associated with the present fort (Parker 1986a, 62–63). The site has been compared with the larger fort of Udhruh in the south (Gregory 1997 II, 357) and also with examples from Egypt (Whitcomb 1990).

### Qasr Bshir

Fifteen kilometres to the north of El Lejjun is a smaller Roman fort, Qasr Bshir, which has quite amazing preservation to the crenelle level. Situated on a flat open plain, a large wadi-fed reservoir lies over 500m to the south-west of the fort. The site is 57 x 54m square with four large corner towers and two gate towers on the western side. Internal rooms are arranged around a large courtyard (Figure 38, page 359). Qasr Bshir was first surveyed by Brünnow & von Domaszewski (1905, 49–60) who described the large inscription (*CIL* III 14, 149) above the gate. This referred to the construction of the building in Diocletian's reign by the governor of the province of Arabia *c.* AD 293–305. It named the site as *Castra*

*Praetorii Mobeni*, which may denote a governor's residence when on tour (see Isaac 1992, 172–175). The site was subsequently excavated by Parker (1987a, 457–495) who showed that it also had an earlier Nabataean foundation, as well as Roman occupation from the late third century to possibly the fifth century.

However, Gregory (1997 III, 343–344) noted that several features, such as the machicolation above the doorway, point to an Early Islamic use of the building. Kennedy noted the absence of the fort from the *Notitia Dignitatum* lists, but did not discuss the fort's inclusion in the Beer Sheva Edict (Ins. 3 Fragment 1& 7; see Chapter 3). While this was discussed by Gregory (Gregory 1997 III, 339), she still only allowed an occupation of the site until the end of the fifth century. However, a listing in the Beer Sheva Edict would place site occupation at least until the middle of the sixth century. Kennedy, following Graf's (1997a) assertion that there is no desert military road, does not see the site as a police post on a road but more probably as a point of contact with the nomads. Nevertheless, it is still regarded as a major state site and included in this analysis.

### Parker's signalling system

As part of the Limes Arabicus Project, Parker carried out a signalling experiment to demonstrate that the towers surrounding the major military sites in the area were part of a larger Roman system designed to monitor and communicate movements of people etc. (Clark & Parker 1987, 165–181). If successful, it would strengthen Parker's view that these sites were designed to monitor and check nomadic movements from the east.

The archaeological database upon which Parker based his sample was taken from the surrounding two surveys of the area by Clarke and Koucky respectively as part of the Limes Arabicus Project (Koucky 1987, Clark 1987; see Chapter 7 for an overview). To justify the selection of sites for a Roman *limes* system, he based his sample upon three criteria: 1) the location of the site, in particular its location within the natural terrain and its location relative to other sites known to belong to the *limes*; 2) the nature of the site itself, especially the architectural remains and 3) the presence of identifiably Late Roman/Early Byzantine (*i.e.* late third to fifth century) sherds in the surface collection from the site (Clarke & Parker 1987, 170). Using these criteria Parker and Clark identified 12 sites that could form a signalling pattern (*ibid.* 171–178). They then carried out an experiment at night, lighting fires to simulate signals between all the posts to identify intervisibility and thus patterns of communication. While the experiment revealed some problems, in general, Parker felt that it demonstrated patterns of signalling and thus a military network.

While the conclusions of the project were illuminating, the methodology behind the experiment must be questioned. In particular, the three criteria for site selection are not as precise as would first appear. His first criterion for site location, that sites would be in a specific terrain setting, is based upon a purely visual interpretation of the landscape. While this does not mean his selection is incorrect, it did not include an awareness of all of the sites sampled, which means the overall process is difficult to evaluate. Of course, today, with the advantage of GIS programs, Parker would have carried out an intervisibility test, which would have more rigorously backed up his data. However, without a contemporary Roman landscape feature to guide the selection process (*e.g.* a road or defensive wall etc.), his list lacks a secure framework. This may have been offset by his second criteria, which attempted to assess the uniform nature of the plans and the architecture of the listed sites. If most of his sites had been similar it would be valid to claim some sort of contemporary function for them. However, Parker does not claim that they possess these features and correctly points out the earlier foundations of many of the tower sites (*ibid.* 170). The earlier history of most of these sites is also shown in the last criteria regarding contemporary archaeological dates for the sites, which can only be based upon surface survey samples.

The date ranges of the sites Parker used are tabulated in Table 12 (page 360). Of the 12 sites listed, 11 are occupied during the Byzantine period, which allows him to use the data as a signalling system pattern in the late third/early fourth-century *limes* system. However, it is curious that Parker included Site 110 as it was only occupied during the Nabataean period, which negates the validity of his third selection criteria. Furthermore, one should also note that 11 of these sites were occupied during the Nabataean period, which Parker does not discuss at all. He obviously assumes that the function of these towers remained the same over hundreds of years.

However, as was discussed in Chapter 2, for methodological purposes in a survey one has to assume that location will reveal some information about function. Thus, Parker was wrong not to highlight and discuss the earlier use of these towers. Indeed, this prompts questions about the Nabataean use of the towers, such as whether they used similar signalling systems, for example. More importantly, however, there is no intrinsic reason why these sites should indicate a signalling system during the Late Roman/Early Byzantine period. Parker's selection process was highly personal, lacked a cohesive contemporary framework, and included sites that were not even occupied during the period in question. Therefore, none of his sites can be included in this study as part of a Roman "signalling" system.

## Al Qatrana

Fifteen kilometres to the east of El Lejjun, at the edge of the desert margins, lies the modern Desert Highway town of Al Qatrana. It was surveyed by the Limes Arabicus Survey and Late Roman/Byzantine ceramics were noted at Site 611 just to the north of the Hajj fort that still stands today (Parker 1987a, 96–97; Figure 39, page 361). This fort was surveyed by Petersen who did not record any Classical remains (Peterson 1986) and dated the foundations of the site, on historical grounds, to AD 1531. However, Peterson accepted that the nearby reservoir could date to an earlier period (Peterson 1986 and 1989) which was also suggested by Parker (1987a, 71). Peterson now subsequently sees the Roman basis of many Hajj forts (see Peterson 2003). On this basis Graf (1997b, 277) suggested the existence of an earlier Roman fort here. Parker had mooted this in his survey but the lack of substantial remains was problematic. However, he did note that on the basis of various gravel levels surrounding the site that the blocks used in the construction of the later Hajj fort could come from a Classical building (Parker 1987a, 71). However, nothing overtly military has yet been found to warrant its inclusion in this analysis.

## Qasr Muhai

Qasr Muhai lies some 15km south of El Lejjun (Figure 40, page 362). This site was given a military interpretation by Kennedy in his recent corpus of sites (Kennedy 2000, 152–153). The site was also reported on recently by Miller in his Kerak survey as Site 436 (Miller 1991, 163–66). An extensive (500m long) site, it occupies a commanding position on the edge of a ridge looking out towards the east and the desert. The ceramic evidence points to occupation from the Late Bronze Age to the Late Islamic with a modern settlement beginning around the time of Glueck's visit in the 1930s (Glueck 1939, 68). All earlier surveyors (see Miller 1991 for summary) noted several large structures but Brünnow & von Domaszewski recorded a square tower in the centre of the sites. Miller subsequently recognised that it was surrounded by a larger rectangular wall (*c.* 60 x 55m) with internal rooms around the wall edge. Kennedy's aerial photograph of the site certainly demonstrates the integrity of this field observation (Kennedy 2000, Fig. 15.13C).

However, Kennedy posits a military function based on these remains. His argument is as follows: "the rectangular form and commanding location suggest a military function and there is a strong possibility that this...was garrisoned in the Roman period given its key location." (Kennedy 2000, 153). However, large rectangular structures, with courtyards and without towers, are a ubiquitous feature of the Classical period, and other earlier and later periods (see Hirschfeld 1997, 1998). In fact, as the date range of the ceramics sample varies

so much it is impossible to assign even a general Classical date without further diagnostic elements. Further, the site has not been planned as Miller's survey was only conducted as an initial prospection survey. Thus the inclusion of this site demonstrates all too clearly the poor logic and incorrect archaeological methods employed in the study of Roman military sites in this region. Until further evidence is forthcoming it is foolish to assign a military function to this set of remains.

### Umm Ubtulah

The site of Umm Ubtulah, lying about 3km west of Er Ruweihi and Hasa, was first discovered by MacDonald in the1980s (MacDonald 1984b). Clearly an important site, it covers an area 520 x 250m along a ridge and lower slope on the northern banks of the Wadi Hasa (Figure 41, page 363). It is divided into an upper and lower area. The upper area has the remains of two towers and is enclosed by a wall with an entrance on the eastern face. Twelve clear internal structures were identified. The lower area, occupying the southern slope of the ridge as it descends into the Wadi Hasa, has the remains of long rectangular structures in the north and south-west areas of the enclosures. The ceramic data points to an Early Bronze Age presence on the upper area and the lower enclosures have some Early Bronze Age sherds among predominately Nabataean/Roman material. It seems clear that the upper area is a Bronze Age settlement, as it is part of a Bronze Age tradition to place settlements on highly defensive areas (Dornemann 1983). However, the lower enclosure area has been interpreted as having a Classical military structure. The long linear rectangular structures occurring in the lower enclosure area have been interpreted as a barracks by Gregory (1997 III, 365–6), Parker (1986a, 89) and Kennedy (2000, 155). It is unclear why. Gregory cites a parallel to the Roman camp at Masada (Gregory, 1997 III, 366), but all have failed to note that the "barrack" buildings are actually located on the steep upper slope of the hill, which has no parallel in Roman or Nabataean military structures in the area. In short, there is little to merit a secure military function for this site in the Roman period.

## A reinterpretation of sites in the Jibal area

This section of military sites occur in the Jibal and Shera'a areas of southern Jordan, roughly from the southern banks of the Wadi Hasa to the edge of the Shera'a range of mountains at Ras en Naqb which overlooks the desert areas of the Hisma (See Figure 35, page 356). All of the sites in the southern Jibal and northern Shera'a areas are within the DAS project area and are fully described in Chapter 6. The DAS sites will only be briefly listed here to contrast ceramic dating and location.

## MacDonald's military monitoring zone

The following sites have all been surveyed as part of MacDonald's Wadi Hasa Survey (WHS) where he delineated an apparent Nabataean-Roman military monitoring zone along the length of the Wadi Hasa (MacDonald 1984a). These 12 sites formed a series of observation points along the southern banks of the Wadi Hasa and were presumed to monitor tribal movements (Figure 42, page 364). All of the sites are intervisible which, allied to a general contemporaneity in ceramics, led MacDonald to posit a monitoring zone operated by the Nabataeans and Romans. However, using the primary ceramic data from the final report of the Wadi Hasa Survey, the argument for such contemporaneity is hard to see (MacDonald 1988). The ceramic dates for Umm Ubtulah and Umm El Adham are from MacDonald's 1984a article. Site 359 produced no ceramic samples. The site types are from MacDonald's field interpretations in his final report. They vary in architectural plan from small towers (or possibly tombs in some cases) to large forts. As Table 13 (page 365) demonstrates, while most of these sites were occupied in the Nabataean and Roman periods, there is no consistent pattern. During the Nabataean period, eight out of 12 sites were occupied, while in the preceding Roman period only seven out of 12 sites were occupied. In fact, as six out of 12 sites were occupied during the Late Islamic period, there seems to be just as much merit in assigning a monitoring role to this period.

Thus the only consistent element in this site pattern is the degree of intervisibility between them. However, in the absence of a synchronous date, the degree of intervisibility is insufficient to argue for the existence of a monitoring zone during the Nabataean and Roman periods. This is not to deny that such a zone may have existed, but the lack of occupation on these sites during the Byzantine period is indeed surprising. This was the period, after all, when the nomadic presence was apparently of greatest concern. As Eusebius' comments on the Wadi Mujib to the north make plain, the Romans placed garrisons within the broken territory of these great wadis in some sort of policing role (*Onom.* 10, 15–24; 11, 13–23. See also Parker 1986a, 48 & Kennedy 2000, 134–136).

## Rujm El Faridiyyeh

The sites in this so-called monitoring zone ranged from large forts to small towers. Umm Ubtulah has been dealt with above and only the four larger sites will be analysed here. Tower sites are a ubiquitous part of the landscape and can be interpreted in many ways (see Banning 1992). Rujm El Faridiyyeh is a site located adjacent to the *via nova Traiana* just after the road has wound its way up the southern bank of the Wadi Hasa (Figure 44, page 367). First properly surveyed by MacDonald during the WHS, it is a rectangular building, 36

x 42m, which appears to be a series of rooms around a courtyard (MacDonald 1988, 226–228 Site 406). A spring of the same name is located just to the west of the building. The site is clearly associated with the road as the date range is from the Nabataean to later Roman period with Late Islamic period ceramics present. The site clearly falls within the class of buildings identified by DAS as a middle range structure of the *via nova Traiana* (see Chapter 6). Thus, the identification of Rujm El Faridiyyeh as purely military structure is somewhat misleading. Further, Parker's suggestion that it "protected a thickly settled region to the west" (Parker 1986a, 89) is entirely incorrect. The site is located on a lower shelf of the Wadi Hasa on which east–west access to the more settled areas in the west is difficult and impractical (see Roller 1983). In fact, it should not be listed as a military site as the DAS evidence shows it is a fairly common feature on the *via nova Traiana.*

### Al Qasr

The other larger sites in MacDonald's monitoring zone are located to the west and east of Rujm El Faridiyyeh. They are only included in Fiema's discussion of military sites (Fiema 1995, 266). Al Qasr, Site 616, is about 5km east of the *via nova Traiana*, and is located on a high spur above a tributary wadi of the Wadi El Hasa. (Figure 45, page 368). A rectangular building 15 x 17m, it has six regular internal rooms. The pottery ranges from Prehistoric to Late Islamic (see Table 13, page 365). The site is similar to one noted by Parker (1986a, 50–53) in the Moab area, Qasr El Al, which has a roughly similar regular layout and is dated to between the Iron Age and Byzantine periods. While there is nothing to preclude a military function, the only evidence provided is location and ceramic dating which, as has been stressed in this study, is insufficient to assign a military function.

### WHS 296

A similar method may be seen in the interpretation of the last site in MacDonald's zone. WHS 296 is a large rectangular site, 33 x 39m, (MacDonald 1988, 212–213) which produced pottery from the Nabataean, Byzantine and Late Islamic periods. Built of well-laid, large ashlar blocks, the site is intervisible with another site in the zone, WHS 291, which, Macdonald argued, corroborated its military function. However, it is similar in layout and size to the farm structures that DAS encountered in the southern area (see Chapter 5). Farm sites and other rural structures may also have been built within a defensive environment favouring good views and using large blocks in construction (Killick 1986). While these sites may provide excellent all-round visibility and are constructed of large, well-made blocks, this is insufficient evidence to posit a military function.

### Ar Ruweihi

Ar Ruweihi is a highly important site at the eastern upper reaches of the Wadi Hasa and lies several kilometres west of the Hajj fort of Qal'at Al Hasa. The site, 62 x 84m, with a towered gate and upper "citadel" area (Figure 43, page 366), lies on a sizeable knoll at the confluence of the main Wadi El Hasa and Wadi Er Ruweihi. Curiously omitted from both Kennedy's and Gregory's corpora of sites, it was surveyed by MacDonald who established a date range from the Nabataean to Byzantine period (MacDonald 1988, 210 Site 674). Both Parker (1986a, 89) and Fiema (1995) include it in their discussions of military sites although, following MacDonald (MacDonald 1984a, 229), they see it as a site positioned to check entry into the Wadi El Hasa area. This military interpretation is followed in this study.

### At Tuwanah

Sixteen kilometres to the south of Rujm El Faridiyyeh is the major site of At Tuwanah, which probably appears on the *Tabula Peutingeriana* as *Thornia* (see Chapter 3), a major stopping place on the *via nova Traiana* heading south towards Petra. First noted by Brünnow & von Domaszewski, (1904, 8–91), and then subsequently briefly surveyed by Glueck in the 1930s (Glueck 1934, 80–81; 1939, 53), it has only been fully surveyed by Fiema in the 1990s (Fiema 1993). Unfortunately, Fiema did not produce a detailed plan. However, he did note that the ceramic samples showed it had a range from the first century BC to the Late Byzantine period with some later Middle Islamic wares (*ibid.* 549). Kennedy (2000, 158–159) again posits a military function to the site. This interpretation focusses on a large 120m square structure on the eastern bank of the wadi. At the centre of the site is a building that has been variously interpreted as a temple (Glueck 1934) or a *caravanserai* (Fiema 1993). However, as no other surveyor has suggested a military function and, as one should discount the "square-ness" factor used by many to assign military function, it is not regarded as a military site by this study.

### Ruwath

Nine kilometres to the south-west of At Tuwanah is the large modern settlement site of Ruwath where considerable Classical period remains have only recently been investigated by archaeologists (Walmsley 1998). As was noted in Chapter 3, the site name has long been equated with *Robothae* listed in Eusebius (*Onom.* 142, 11, 11–12; 143, 11, 14–16), the *Notitia Dignatatum* (*ND Or.* 34, 27) & the Beer Sheva Edict (Fragment V, line 8) where a military garrison was stationed. However, as was argued in Chapter 3, this identification may be incorrect and the ancient name may be equated with the remains of Qasr Fayfa in the

Wadi Arabah. While this identification is contentious the present archaeological survey has found little of military significance apart from the remains of two apparently unconnected towers (Walmsley *et al* 1999, 462).

A significant factor in the argument against the identification of Ruwath with *Robotha* was the location of the ancient site now occupied by modern Gharandal, which lies just to the east of Ruwath. Gharandal was probably the major town of the Jibal area in the Classical period (termed *Gabalitis* in later Byzantine texts or *Gebalena* in Eusebius) and the archaeological remains cover a sizeable area (see Walmsley 1998, Walmsley *et al* 1999). The site is located on a strategic route from the edge of the Plateau and the so-called King's Highway to the Desert routes to the east and in the Classical period to the *via nova Traiana* (See Chapter 6). Further, the series of settlements – Buseirah, Gharandal, Ruwath – are all located at the head of wadis that are the main routes to the Arabah and thus across to Palestine. Gharandal has always been equated with ancient *Arindela,* and Gharandal in the Wadi Arabah has been equated with *Arieldela* or *Ariddela* (see Chapter 3).

However, as was argued in Chapter 3, these are all probably variants of the same name and most likely refer to modern Gharandal in the Jibal area. If so, then there was a garrison there since at least the turn of the third century. At present, the archaeological excavations of the site have focussed on a Byzantine church that demonstrates considerable reuse into the Early Islamic period (Walmsley *et al* 1999, 462–465). However, the church is built against a massive wall which forms part of a large (65 x 25m) double compound that would have been in the southern part of the ancient site (Figure 46, page 369). The building has undergone extensive reuse in later phases but Walmsley speculates that it may have been part of temple complex similar to Khirbat At Tannur or the South Temple at Petra, and thus probably dates, on architectural grounds, to the Nabataean or Early Roman period (Walmsley *et al* 1999, 465). No other evidence of large state/military buildings has been found. Thus, it is believed that Ruwath cannot be considered a military site.

### DAS project area

It is sufficient here to list briefly the sites considered by this study to be military, followed by those being reassigned a non-military function. Two sites that lie on the *via nova Traiana* are newly discovered military sites. They are Khirbat Hodiah (DAS 210; Figure 104, page 429) which is just south of At Tuwanah, and Khirbat Samra (DAS 160; Figure 105, page 430) which lies on the Ifjeij plain. Both sites are occupied for most of the Roman period. The other sites in this area are well known from previous surveys. Of these, Khirbat Dajaniyah is the largest and best known and is occupied from the later Roman period to the end of the

Byzantine period. It is located in the middle of the Ifjeij plain. The last site in this group, Khirbat Qannas (DAS 193; Figure 114, page 442), is a definite fort site with a later *caravanserai* building attached. It is situated halfway between Khirbat Samra (DAS 160) and Khirbat Dajaniyah (DAS 200) on the Ifjeij plain. It is occupied from the Nabataean period until the late Byzantine period. All these sites had clear military features, such as towers and standard Roman military plans, and are detailed in Chapter 6 as part of the military systems noted within the DAS project area.

Two sites to the north-east of Dajaniyah (DAS 200; Figure 102, page 428) are located around the Hejaz railway station of Jurf Ed Darwish. These are the so-called fort, Jurf Ed Darwish (DAS 235; Figure 109, page 436), and a nearby tower, Qasr El Bint (DAS 236; Figure 103, page 429). Qasr El Bint is occupied from the Nabataean period onwards while Jurf Ed Darwish seems to date from the later Roman period. However, DAS has discounted both these sites as having an overtly military significance as they seem more likely to be road stations or *caravanserais* (see Chapter 6).

## A reinterpretation of sites in the Shera'a area

Across the Ifjeij plain, south of Khirbat Dajaniyah, Khirbat Qannas and Khirbat Samra, begins the region of the Shera'a mountains. This region ends at the edge of the Jordanian Plateau some 60km from the Ifjeij plain. Within this area of high mountains and frequent springs are situated two of the largest settlements in southern Jordan: Petra and Udhruh. However, like the Jibal area, the main area of settlement is strung out along a10km strip along the edge of the Plateau. This section also includes some desert fringe settlements such as Ma'an, now a major provincial centre 30km east of Petra.

### Petra

The main town of Petra has no attested military sites but has a collection of inscriptions relating to soldiers (see Kennedy 2000,166–167). As Kennedy points out, Eusebius does not credit the place with a garrison nor is it listed in the *Notitia Dignitatum*. However, Petra is listed in the Beer Sheva Edict (see Chapter 4) but seems not to refer to the city but to something "in the territory of Petra", which may denote an imperial estate.

### Udhruh

Sixteen kilometres east of Petra is the large military site of Udhruh (Figure 47, page 370). An important settlement site since the Nabataean period (Killick 1990), the site was investigated by Killick in the 1980s but, unfortunately, he has not published a final report of

the excavation of the fort at Udhruh or the surrounding survey (Killick 1983a & b, 1986, 1987). The site is placed to take advantage of the spring that not only feeds the settlement but irrigates the large field system that flows eastward along the wadi. The main site of Udhruh is a massive fort that covers an area of 4.7 hectares and is slightly larger than El Lejjun (see Figure 37, page 358). At an architectural level, Gregory notes its superior building and sophistication compared to El Lejjun. Given its large size and its similarity to the known legionary fort at El Lejjun, it is thought to be the base of a legion (Gregory 1997 III, 388).

Killick (1983a, 1983b) at first put forward a Trajanic date for the building of the fort but this has been refuted by Parker (Parker 1986a, 94–98), among others. Most would follow Parker's assertion that, given the similarity in plan to El Lejjun, the fort at Udhruh was probably built around AD 300 and lasted until the Late Byzantine period. Certainly, as the Beer Sheva Edict shows (see Chapter 3), Udhruh's tax contribution was the largest of all of the sites in southern Jordan, which would strengthen the argument for it being a legionary base.

However, Udhruh is not listed in the *Notitia Dignitatum*, which, as it is dated to *c.* 400 (see Chapter 3), conflicts with the archaeological evidence. The only entry in the *Notitia Dignitatum* that has been located in the area is the *Cohors prima argentenaria* at a place called *Tarba* (*ND Or.* 34, 40). This has generally, though not convincingly, been equated with the modern settlement at Al Jarba, 2km north of Udhruh (see Chapter 3). At best, one can speculate that the entry in the *Notitia Dignitatum* is misnamed and really refers to Udhruh. However, it is hard to see why a clerk in the imperial capital would have confused the name of a small village with a much larger military unit site. At a landscape level, one should also note Udhruh's similar position to El Lejjun. It is situated between the *via nova Traiana* and the Desert road, and blocks the main entrance to Petra from the east along the Wadi Arja. However, this study regards it as a clear military site.

### Al Jarba

Although briefly reported by Killick (1986, 438; 1983a, 127 site E), who established that it was a predominately Classical period settlement, little else is known about Al Jarba. To the south of the site, on a high hilltop with good views to the south and east, is a large tower site (Killick 1983a, 127). This seems to be the only structure that could be assigned a military function but it is clearly not of sufficient size to be the location of the named unit referred to in the *Notitia Dignitatum.* It does not have a proven military function.

## Khirbat Arja

Killick noted a fort (18 x 14m) to the north-west of Udhruh above the tributary of the Wadi Arja (Killick 1987, 30) which Kennedy includes in his corpus (Kennedy 2000, 168). Graf called it Khirbat Arja and termed it a *castellum* (Graf 1997a, 279 & Fig. 5) which apparently monitored traffic along the Wadi Arja towards the *via nova Traiana* and Petra. Khirbat Arja is actually a major site within the Wadi Arja and is marked on the 1:50,000 maps as such, although locals call it Abu 'Alaq. The site referred to by Killick and Graf may actually be one surveyed by DAS. DAS 268 is about 1km north-east of Khirbat Arja and is a rectangular structure (17 x 22m) set on a knoll overlooking a small wadi. It has rooms on all sides with an entrance on the southern face leading to an internal area 5 x 7m. While the sizes differ somewhat, the description sounds similar. However, it must be noted that this type of structure is very common in this landscape (see Chapter 5). It is more likely to be a small farm, not a military site.

## Ma'an (Al Hammam & Al Mutrab)

Twenty-two kilometres to the south-east of Udhruh is the modern town of Ma'an where two sites have long been identified as military structures. Al Hammam (Figure 48, page 371) and Al Mutrab (Figure 49, page 372) were first recorded by Brünnow & von Domaszewski (1905, 1–6) as military structures. While many researchers have been cautious, all have since recorded them as military sites (see Kennedy 2000, 174–176). As will be demonstrated in Chapter 8, these sites are, in fact, part of a massive agricultural farm and should not be put in any corpus of military sites.

However, it is not implausible that a military site would have been located in the area as it was (and still is) the main point for traffic into Arabia. It is clear from the Petra Papyri (Koenen 1996) that the site of *Admatha* is probably equated with a site around the Ma'an area. If this is so, then the listing in *Notitia Dignitatum* places a garrison of camel corps here (*ND Or.*34.33 *Ala Antana dromedariorum, Admatha*; see Chapter 3). Unfortunately, the main town of Ma'an has never been properly surveyed. There is a Hajj fort in the main town which is dated to AD 1531 (Peterson 1989). But as DAS has shown that as Qala'at Unaiza (see Chapter 6) had an earlier Classical building, and the Hajj fort of Qala'at El Hasa is only a short distance away from a similar Classical building, it is highly probable that a similar Classical building is in the area of Ma'an. It was noted, on a visit by the DAS project, that there were clearly different embossed masonry blocks in the walls of the Hajj fort, which is now a visitor centre, that could have come from an earlier building. However, as yet there is insufficient evidence to posit a Roman military site in Ma'an.

### Jabal Tahuna

A small *castellum* has been noted at Jabal Tahuna, a site several kilometres to the north-west of Ma'an and about 12 km from Udhruh. Killick (1986, 438–40) first reported the site as a "rampart" 4km long enclosing an area with a town and farming system and possible fort (Figure 50, page 373). Graf, who worked on the Udhruh survey with Killick, posited a military location (Graf 1997a, 279). The site was visited by DAS and the following observations were made. The site is actually an extremely large water catchment area, and to this day a water pipe still runs to the city of Ma'an from here. The long ramparts are in fact a boundary field wall that encloses clear areas of irrigated fields systems. While there are structures in the north-west area, many of them are really field systems. There was no indication of a fort.

### Abu Danna

To the south of Udhruh several forts have been identified on the line of the *via nova Traiana* and its by-roads. However, it should be noted that some of these identifications were made prior to Graf's extensive survey of the route of the *via nova Traiana* which firmly established that it went through Petra and not through Udhruh as previously assumed (Graf 1995). A fort at Abu Danna was previously noted by Killick (1986, 438) 10km south of Udhruh on what is now a branch road leading to the *via nova Traiana* (Graf 1995, 246). Graf calls it a *castellum* (Graf 1997b, 279). The site has not been surveyed properly and no ceramic data has been presented in Killick's publications. If it is associated with a branch road then it seems more plausible to term it a road station, similar to the ones encountered on the *via nova Traiana* in the DAS area (see Chapter 6), rather than a fort.

### Khirbat El Ail

This branch road met the *via nova Traiana* at Basta where no military remains have been identified. However, about 5km to the south of Basta a *via nova Traiana* fort was noted at Khirbat El Ail (Figure 51, page 374). Situated on a hill overlooking the *via nova Traiana,* it was a rectangular structure, *c.* 60 x 69m, with internal structures and a probable tower on its south-east corner. Parker's ceramic samples suggested use from the Iron Age to the end of the Byzantine period and then in the Late Islamic period (Parker 1986a, 98–99). Parker accepted that the site was military but noted the relatively thin walls (*c.* 1m). However, as has frequently been shown above, the site plan could also correspond to a farm site. Also, as it is not immediately adjacent to the *via nova Traiana,* one cannot argue for it being part of the road infrastructure. Therefore, it has neither a military nor a state function.

### Khirbat Dor, Fardhakh and Suwaymira

To the south of Ail are three other sites that have been identified as forts. Khirbat Dor (Weippert 1979); Fardhakh (Graf 1995, 248) and Suwaymira (Glueck 1934, 70). All of these sites were included in Fiema's 1995 corpus of sites (Fiema 1995, 266 Table 2). Graf has briefly noted many other similar sites in his 1995 article on the *via nova Traiana* in southern Jordan (Graf 1995, 246–249). As Fiema participated in this survey (Graf 1997b, 274), it is not surprising that he includes this data in his corpus. However, all of these sites lack a published plan and date which makes a secure military interpretation impossible.

### Es Sadaqa

In fact, the lack of published data in the southern area of the Shera'a is problematic for settlement reconstruction in general, let alone for proper comparison of military and agricultural/settlement structures. This is apparent from the research done around the site of Es Sadaqa, 7km south of Khirbat Ail. An important site, it was one of the stations of the *via nova Traiana* listed in the *Tabula Peutingeriana* as *Zadagatta,* and in the *Notitia Dignitatum* (*ND Or.* 34, 24) and Beer Sheva Edict (where it had the third largest tax contribution for the area) (see Chapter 3). For such an important settlement containing a military fort, research has been rather slight. Parker's survey of the site, while noting the remains of a large rectangular structure in the main site, prefers to concentrate on a tower (Rujm Sadaqa) to the east of the main site. Graf carried out a small excavation around the remains of this large structure in 1989 (Graf pers. comm.) but the results have not been published. Kennedy's aerial survey of the site at least provides some data on site size and layout (Kennedy 2000, 177 and Fig. 18.4C). The structure is probably 120 x 80m with clear fort-like projecting rectangular towers at corners and mid-wall points (Figure 52, page 374). Unfortunately, the date of the structure is unknown but Hart surveyed the site in the 1980s and he classed it as a settlement. He noted that there were first to second century ceramics, with some Early and Late Islamic wares (Hart & Falkner 1985, 271 Site 80). Therefore, the site is considered here to be military, although it lacks a secure archaeological date.

### Khirbat El Qirana

Eighteen kilometres to the south-east of Es Sadaqa lies the site of Khirbat El-Qirana. It was argued in Chapter 3 that this could be the military site of *Sabure sive Veterocariae* of the *Notitia Dignitatum* (*ND Or.* 34, 28). The site lies on the edge of the Jordanian Plateau overlooking the Hisma and sits on a desert route from the south-east. First noted by Musil (1907–08, 229–230) and then by Glueck (1935, 62), the site has suffered from somewhat

inaccurate descriptions (see Gregory 1997 II, 400–401). Parker's ceramic survey of the fort area concluded an Iron Age to Byzantine occupation with a further Late Islamic occupation (Parker 1986a, 104). Kennedy's aerial survey of the site provided the first reasonably accurate plan of the site (Figure 53, page 375) (Kennedy 2000, 177–78), and reconstructed a fort 70 x 45m with corner and mid-wall towers. This interpretation is accepted.

### Al Batra

Ten kilometres east of Qirana is a small tower site called Al Batra (Figure 54, page 375). Situated on a large hill (Jabal Al Batra), it has excellent all-round views and both Qirana and Sadaqa are visible. However, it is unclear why both Kennedy (2000, 178–179) and Gregory (1997 II, 402–403) include it in their corpora of military sites. It seems that site function (as a tower) and intervisibility with other known military sites are the sole reasons for the military identification of this site. However, as has been repeatedly emphasised in this study, this is not sufficient to warrant its inclusion in a military system.

## A reinterpretation of sites in the Hisma desert area

The following sites are all located on the route of the *via nova Traiana* as its descends from the Shera'a mountains and winds its way through the Hisma desert towards *Aila* (modern Aqaba). This settlement is the terminus of the *via nova Traiana* on the shores of the Red Sea. The route of the *via nova Traiana* in this area was first traced in the 1930s by Alt who reported milestones associated with the route of the road (Alt 1936). However, Graf (1995) surveyed the road fully, adding many new milestones and reporting on smaller sites such as towers. Unfortunately, as with the sites on the Jordanian Plateau, Graf's article, while sufficient for textual and historical purposes, is inadequate as an archaeological report of the remains in the area.

Away from the road, Graf's (1979) survey of military sites in southern Jordan recorded many towers in addition to the larger sites described here. He concluded that as many only had Nabataean pottery, they had gone out of use during the Roman period. On this basis he postulated a distinct Roman retrenchment of Nabataean military sites upon annexation. However, his use of towers as a diagnostic military feature was never fully demonstrated, only assumed. Further, his use of Nabataean pottery to show a direct correlation with Nabataean political activities and a chronological break with the preceeding Roman period, while reflecting current thinking at that time (see Fiema 1995), has now been superseded by a greater awareness of the use and longevity of these distinctive wares. However, a full

analysis of Graf's survey cannot be attempted here as he did not fully publish his findings except for brief notes in other publications (*e.g.* Graf 1995).

## Humayma

The first military post encountered south on the *via nova Traiana* is the important settlement site of Humayma. The site was first noted by Musil (1926, 50). It was subsequently surveyed by Frank (1934, 236–7) who noted the outlines of a large fort that he presumed to be of Roman period on the basis of the ceramics found on the surface of the site. Stein surveyed the area (Gregory & Kennedy 1985, 323) in 1939 and confirmed its identification as *Hauara* of the *Tabula Peutingeriana* (see Chapter 3). Parker surveyed the site in the 1980s (Parker 1986a, 104–105) and noted ceramics spanning the classical period. Graf and Eadie began a regional survey of the area during this period but it was not completed (Eadie 1984).

The site and its environs have been under investigation since 1991 as part of the Al Humayma Excavation Project (Oleson *et al* 1993, 1995, 1999, 2001) although preliminary work had been done by the director as part of a wider hydraulic survey of the area (Oleson 1988 & 1990). The project confirmed the status of the site as one of the most important settlements in the area. One should note that a second large structure to the south of the main fort was variously described as a *castellum* (Parker 1986a, 105) or *caravanserai* (Gregory 1997 II, 399). However, excavation of this site proved that it was an early Islamic building, probably the main residence of the Abbassid family who owned Humayma during this period (Foote 1999).

The fort measures 206.32 x 148.3m, which corresponds to 770 x 500 Roman feet. It has corner and wall projecting towers and four gates on each wall face (Figure 55, page 376). In the centre of the fort the excavators noted a large building (the east face is 29.42m wide) that they interpreted as a *principia* (Area G in Figure 55). Sixty metres to the south of this building they located another set of rooms that contained a mass of military metal artefacts. This was taken to indicate the presence of a workshop or barracks. The excavators discerned two phases of site occupation.

Phase I of the fort's stratigraphic sequence was clearly built not long after annexation in AD 106, on virgin land, to the north-east of the Nabataean settlement (Oleson *et al* 1995, 321–330; 1999, 414–421). This occupation continued throughout the second and third centuries. During this period, as attested in an inscription found at the site, a vexillation of the *III Cyrenaica* was stationed at the fort (Oleson *et al* 2002, 112–116). Another inscription may imply the presence of the troops of the *VI Ferrata* during an early period of Phase I (*ibid.*

110–112). The lack of coinage from Diocletian's reign suggests that the fort was abandoned during the later third/early fourth century. However, the fort was in use from the Constaninian period onwards (Phase II), as reflected in the coinage, and ceased occupation at the end of the fourth century. This presents problems as the site is attested in the Beer Sheva Edict which dates to the early sixth century (see Chapter 3). Thus, either the later phases of the fort were robbed for use in the later Byzantine/Islamic settlement (Oleson *et al* 2002, 105), or the military relocated to a new site. No other Classical military sites have been found in Humayma.

### Khirbat Quweira

Khirbat Quweira (Figure 56, page 377), the next major military site, is situated 18km south of Humayma on a prominent outcrop of Jabal Quweira overlooking the *via nova Traiana*. From here, a route would have gone to the Classical sites in Wadi Ramm (Tholbecq 1998). The site may be identified with *Apud Praesidium* of the *Notitia Dignitatum* (*ND Or.* 34.35 and see Chapter 3). The site was first described by Musil in 1910 (1926, 62–64) as a fort which was being used by Turkish troops. Glueck (1935, 58–59) subsequently noted the building of a Mandate fort in the 1930s and the presence of Nabataean pottery. Alt planned the site properly after Glueck and showed the site to be almost square (32.5 x 31.5m) with square projecting towers on each corner (Alt 1936, 96–98). Parker surveyed the fort for ceramics and noted a range of ceramics from the later Nabataean period to the Early Byzantine (Parker 1986a, 105). Graf dug a small sondage in the fort in 1989 and found Roman period ceramics and coinage (Graf 1995, 258). The site has a clear military function.

### Khirbat El Khalde

The identification of *Apud Praesidium* depends on the location of *Praesidium* of the *Notitia Dignitatum* and its equation with *Praesidio* of the *Tabula Peutingeriana* (see Chapter 3 for details). This site has been securely identified as the modern site of Khirbat El Khalde which lies 17km south of Quweira on the line of the *via nova Traiana*. The site lies within the Wadi Yutm between the edge of a high gorge and an outcrop in the wadi. It is dominated by the surrounding wadi slopes. Fifty metres to the south of the fort is a second smaller rectangular building (32 x 22m). This seemed to be a *caravanserai* structure with a set of rooms around a courtyard with an entrance at its northern face facing the fort. To the north-west there were also six large cisterns which were refurbished in the Mandate period. Here, a coin of Constantine II (AD 337–340) was found (Kirkbride & Harding 1947, 24). These large water supply features and the possible *caravanserai* structure amply testify to the importance of the site as a major stopping place on the *via nova Traiana* through the Hisma. Stein noted a

water channel that brought water from a spring to a cistern in the fort (Gregory & Kennedy 1985, 310–312).

Although first noted by Savignac (1932, 595–596), Alt provided a more detailed description but no plan (Alt 1936, 101–103). Parker surveyed the site for ceramics and showed a range from Nabataean to Late Byzantine (Parker 1986a, 179). However, these surveys did not provide a satisfactory description or overall plan due to the damage caused to the site by the building of the adjacent Hejaz Railway. Graf provided a plan of the building in his 1995 article and reported similar pottery to Parker's sample, with the addition of coinage from Diocletian's reign and some later Byzantine material (Graf 1995, 260).

However, Graf's plan did not match earlier surveyors' who had noted distinct internal features. Kennedy (2000, 188) provided the first complete plan of the site which showed it to be a rectangular structure 49.5 x 32m with projecting towers on all corners (Figure 57, page 378). The entrance is on the northern face and led into a possible double court-roomed interior. The larger courtyard at the east of the structure had a plaster-lined cistern in the centre of the area. In one of the rooms in the smaller courtyard a bath suite was noted (Kennedy 2000, 189). While there is evidence of later refurbishment, this is a clear military site.

### Khirbat Kithara

The last clear military site on the route of the *via nova Traiana* before Aqaba is Khirbat Kithara. Situated some 16km south of Khirbat El Khalde and 20km north of Aqaba, the site lies at the intersection of Wadi Yutm and Wadi Imran on a spur overlooking these wadis. As mentioned above, and noted in Chapter 3, this site could be equated with the entry *Apud Praesidium* in the *Notitia Dignitatum*. The site has been extensively damaged by the construction of the Hejaz Railway. Although Glueck noted Nabataean, Roman and Byzantine pottery at the site, as did Savignac (1932, 594–595), he did not survey the area fully (Glueck 1934, 54). Alt (1936, 104–105) provided the first full plan of the site that proved it was a fort (Figure 58, page 379). Parker (1986a, 179) took a ceramic sample of the site which contained a range from the Nabataean to Late Byzantine period. The plan of the fort is unusual, as it is a diamond shape with sides 49, 48, 35.5 & 31.6m long. This shape was determined by the nature of the spur on which it was located (see Kennedy 2000, 191, Fig. 19.12 for a photo). There are projecting square towers on each corner. There are internal rooms flanking all walls except the north-east area where the entrance is probably located. In the centre of the courtyard there is a free-standing building (7.3 x 9.15m) which Alt considered to be from a different period than the main fort (Alt 1936, 105).

## A reinterpretation of sites in the Wadi Arabah

The terminus of the *via nova Traiana* is at the port city of *Aila*, which is now covered by the modern town of Aqaba. The city is situated at the head of the Gulf of Aqaba at the southern end of the Wadi Arabah. It is so placed as it is the best natural harbour along the Red Sea coast north of *Leuke Kome* (modern 'Aynunah in Saudi Arabia) in the Hejaz (Young 2001, 94). The Wadi Arabah is a continuation of the Great Rift Valley fault, which allows easy access up and down the valley but which makes crossing the fault feasible only at certain points. These crossing points are usually determined by the presence of springs. This is a feature of the whole semi-arid region, especially in an area where much of the Wadi Arabah is below sea level. The Wadi Arabah varies in width between 5 to 15km and settlement is usually restricted to small areas clustered around springs that appear at the foot of the Shera'a mountains and the Negev plateau. The main focus of settlement, however, is at either end of the Arabah: at Aqaba and As Safi at the southern end of the Dead Sea.

In this section, the description of sites will go from south to north and will, for the most part, follow the natural communication lines of the area. It should be noted that it is only since the establishment of Israel in 1948 that the Wadi Arabah has become a frontier line. This has meant that two parallel lines of communication have developed and gives the impression that travellers followed similar routes in the past. Actually, there was only one route north from Aqaba in the past which divided in the area around Gharandal (see Figure 59, page 380), and then two routes continued on each side of the Wadi Arabah. While publications like the *Tabula Imperii Romani* (Tsafrir *et al* 1994), on their maps, show a definite road on the upper northern Israeli side of the Arabah within modern Israel, in fact, the most important road was on the Jordanian side.

As has been argued in Chapter 3, the evidence from Ptolemy and the *Tabula Peutingeriana* clearly points to sites on the Jordanian side of the Arabah. This is not surprising as the main springs are usually found on the Jordanian side. In fact, after modern Yotvata, the next large settlement on the Israeli side with major springs is at Haseva (Ain Hosb) some 105 km away. Similarly, following most Israeli scholars, the *Tabula Imperii Romani* (Tsafrir *et al* 1994) shows direct routes from Wadi Faynan to Haseva and from As Safi to En Tamar (Ain El Arus) (see Figure 59, page 380). This is incorrect and has contributed greatly to the misinterpretation of military site locations. The closest stopping point across the Arabah from Haseva is the site of Qasr Et Tlah, which was used by Glueck in the 1930s. Similarly, the closest point for En Tamar was Fayfa (where Qasr Fayfa is located nearby). The implications of this will be discussed in the appropriate site entries.

## Aqaba

Although Aqaba has long been recognised as an important trading point on the Red Sea coast, its Classical remains have only been investigated relatively recently. Earlier scholars such as Woolley and Lawrence (1936), Frank (1934, 243–245) and Glueck (1935, 46–47; 1939, 1–3) noted the Iron Age and Islamic periods with only brief references to Classical remains. Subsequent development of the port of Aqaba by the Jordanian Government obscured much of the area, but Whitcomb (1987, 1989, 1990, 1993, 1995a, 1995b) was able to locate and excavate the early Islamic walled city situated on the present beach area. It was occupied from the Early Islamic period in the seventh century to about the twelfth century. Over a number of seasons he uncovered an extensive walled settlement (165 x 140m) with four gates, projecting corner and wall U-shaped towers, which enclosed an area of large public buildings (Figure 60, page 381). The first phase of this settlement, termed Phase A in his stratigraphic scheme, he dated to the Early Ummayyad period, c. AD 650–750 (Whitcomb 1993, 542).

However, several scholars have sought to see a Classical military foundation for this settlement. In particular, Knauf and Brooker (1988) first suggested that the plan could reflect the establishment of the legionary base of *X Fretensis* around the time of Diocletian, which was referred to by Eusebius and again listed in the *Notitia Dignitatum* (*ND Or.* 34.30 and see Chapter 3). Knauf and Brooker point to the location of the central structure (see Figure 60, page 381) as exhibiting the features of a *praetorium,* and to the presence of similar shaped towers on other sites such as Lejjun and Udrhuh. Whitcomb (1990) rejected these suggestions robustly and ascribed overly "classical prejudices" (*ibid.* 158) to these claims. In particular, he drew attention to the small size of the structure compared to both Lejjun and Udhruh, which were more than double in size. Whitcomb (1993, 1995a) has defended this view over a number of articles although it will only be resolved with the final report. Both Parker (1997, 21) and Zayadine (1994) support this view.

However, Gregory (1997 II, 413) and Kennedy (2000, 196) still refer to this structure as a Roman fort. The most compelling argument is that, due to the high water table, the lowest levels are difficult to penetrate. Whitcomb (1995a, 504–505), in his discussion of the excavation of Tower 22 to the south-east of the site, states that the tower is Early Islamic in foundation. However, in the section plan of that tower (Figure 61, page 382) he does not show any deposits below the original pavement of the tower. In a discussion of other areas of the site, Whitcomb (1990, 159) admits to earlier ceramics occurring in predominately Early Islamic levels but does not explain the context of these sherds. Are they upcasts from earlier

levels or some transfer of material from the Classical city of the original construction phase? The distinction is important and, as yet, unresolved.

The recovery of a Latin building inscription from within a tower of the Egyptian Gate again highlights this problem. The inscription (see MacAdam 1989) seems to date from the early fourth century and refers to reconstruction work, involving the military, which evoked the names of both Caesars (*ibid.* 168) and may refer to the arrival of *Legio X Fretensis* (*ibid.* 171). These inscriptions are typical of the Tetrarchic period when numerous military reconstruction works were commemorated in this fashion. However, MacAdam, no doubt following Whitcomb, suggests that it was taken from the nearby Classical settlement (*ibid.* 169). Again, the presence of such a building inscription in a gate area (where one would naturally place such things) requires a greater contextual explanation.

In 1990, Meloy (1991) carried out a survey to the north-west of this Islamic city and found evidence of a substantial Classical settlement, which had been noted by Woolley & Lawrence (1936, 144) (Figure 62, page 383). Accordingly, Parker (1997b, 1998, 2000) carried out several seasons of excavation in this area and uncovered clear domestic Classical settlement and an Early Byzantine curtain wall with towers (Parker 1998, 383–384). However, the walls do not seem to be associated with any overtly military presence but to part of the Classical city wall. The close proximity of this settlement area with the Early Islamic town is interesting and recalls the landscape setting of Roman military sites with nearby settlements such as at Udhruh.

As is clear from the textual sources, *Aila* surrendered to the Islamic forces on favourable terms (Zayadine 1994, 499). No destruction ensued (Kaegi 1992, 82) and settlement areas clearly continued undisturbed (at least in recorded texts). Therefore, it is unclear why neither Whitcomb nor Parker provide sufficient explanation for the founding of this new Early Islamic city, or the decline of the Classical city a mere 20 years after the surrender of the city. Until the final report appears, there will remain sufficient doubt about the Early Islamic layers being the earliest part of the structure, so a Classical date and a Roman military structure are postulated here.

### Wadi Arabah (Horvat Dafit to En Tamar, Israeli side)

This section will describe the routes up the Wadi Arabah from Aqaba to the area south of the Dead Sea, which is called the southern Ghor. The discussion will be divided into an Israeli and Jordanian section and will first deal with the Israeli sites situated north of Aqaba to the site of En Tamar (Ain Al Arus) south-east of the Dead Sea.

## Horvat Dafit

About 18km north of Aqaba is the small site of Horvat Dafit (Arabic Ain Defiyah). Although first noted by Rothenberg (see Stern 1993, 1135), it was excavated in 1983 by Cohen (1984a, 16–17) who termed it a fort. However, the site is also viewed as a road station (Stern 1993, 1135). Cohen distinguished three phases of occupation, the first of which (Stratum 3) consisted of a courtyard building, 23.7 x 18.2m, with thirteen rooms. This was dated, by pottery and coins, to the later Nabataean period where coins of Aretas IV (*c.* 9 BC – AD 40) were found. In Stratum 2 this plan remained fairly unchanged but in Stratum 1 a tower (5 x 6m) was built in the south-east corner of the site and the rest of the rooms were not used. This phase is dated to the third to fourth centuries and does not seem to extend into the Byzantine period. The attribution of a military function to this site rests solely on the presence of a tower, which, it is argued, is insufficient evidence.

## Yotvata

The next major site on the track leading from Horvat Dafit, over 20km away, is the major oasis site of Yotvata (Arabic Ain Ghadyan). The area has been extensively described in the past by Musil (1907–08, 186–190), Woolley & Lawrence (1936, 32–33), Frank (1934, 239–40 Plan 35A) and Glueck (1935, 41 Site 19). Frank correctly identified a Roman fort in this area, which was excavated in 1975–6 by Meshel (1989). The site has been equated with the *Tabula Peutingeriana* site of *Ad Dianam* but this has been questioned in Chapter 3. Following the establishment of the state of Israel (*e.g.* Aharoni 1954, 12–14), more intensive surveys established the full range of occupation in the area from Chalcolithic to Early Islamic (Stern 1993, 1517). A bathhouse was found 100m from the fort (Meshel 1989, 234–236, Fig. 4). A second site in the area had been noted in the initial surveys (Aharoni 1954) as a Roman *caravanserai* or other fort, but was shown upon excavation to be an Early Islamic building (Stern 1993 1520; Avner & Magness 1998, 49).

Meshel's excavation, confirming Frank's identification of the site as a fort, showed it to be a square structure 39.4 x 39.7m with external corner towers 4 x 5.3m (Figure 63, page 383). The trial sections in the site showed the occupational sequence to comprise two levels interspersed with a destruction layer (Meshel 1989, 230–234). The ceramic and coin data (Kindler 1989) showed that the two layers were close together lasting from the later third century to the mid-fourth century. However, one must remember that only 7/8 small sections were dug in the site and they were mostly dug against the external walls. No internal remains were investigated and thus there must be doubt about the authority of the sequence elaborated by Meshel.

However, in 1985 a large inscription plaque was found near the site which relates the Tetrarchic foundation of a unit at Yotvata – *ala Costia constiturent*. This is not accepted by Roll, who believes it refers to the rebuilding of a structure in the fort. However, in his discussion of the plaque, Roll (1989) discusses the road system of the Arabah where he postulates a route along its western side, following the modern roads in the Israeli area (see Figure 59, page 380). Roll's interpretation is now enshrined in the *Tabula Romani Imperii* (Tsafrir *et al* 1994). Meshel (1989, 229, Note 6) disagrees with this but bases his comments on an erroneous interpretation of the *Tabula Peutingeriana*. Avner (1996) has discovered a stretch of ancient road to the north of Yotvata. He notes milestones that have the legend – *ABOSIA*. This probably means *ab Osia*. As Isaac (1998, 71–72) noted, this correlates well with the textual reference to the *ala Costia* at Yotvata. As was argued in Chapter 3, the Arabah road was probably along the line of well-known forts situated along the modern Jordanian side. Indeed, even in previous Israeli studies of the western Arabah, only one site is situated on the western side of the Arabah – Mezad Beer Menuha. Nevertheless, a military presence at Yotvata is clear, although of uncertain duration.

### Mezad Beer Menuha

Mezad Beer Menuha is located over 50km north of Yotvata, and over 26km south of the next major oasis at Moyat Awad. Thus, it is unclear why Israeli scholars would postulate a route over this terrain when the road stations are so widely spaced. The site itself has been described as a fort by Cohen (Stern 1993, 1135) but in the original excavation note (Cohen 1984b) he terms it a road station. As was stressed in Chapter 2, such confusion in terminology is widespread and greatly hinders the study of military remains in the area. The site has two main phases. The first was a 21 x 18.5m rectangular building around a courtyard with rooms on all sides. This was dated by coin evidence to the first century BC to the first century AD. In its second phase this building went out of use and a tower (9.5 x 9.5m) was erected. This phase is dated to the second to third centuries. Cohen (Stern 1993, 1135 and Cohen 1984b, 205) states that the change of buildings was due to destruction by the Romans in AD 106 upon annexation. However, it is argued here that the first phase of the building would appear to be a *caravanserai* type. The second phase changeover to a tower certainly indicated a complete change of use but does not show Roman military action. All it demonstrates is that the road infrastructure was downgraded at some point in the second century. Therefore, a military interpretation for this site cannot be maintained.

## Moyat Awad

As was noted above, Moyat Awad is the next major site to the north of Mezad Beer Menuha. Situated at the head of the Wadi Umm el Qasr, it is an important point on the main east–west route from Petra to Elusa and then on to Gaza. It is on the opposite side of the Arabah from the major military site of Bir Madhkur (see below). Certainly, the main building of the area, first noted by Frank (1934, 274–276) as a *castellum* (Figure 64, page 384), was shown on excavation by Cohen to be a *caravanserai*. This site is about 44 x 41m and has a standard-courtyard plan with rooms on all sides. Along the southern side were nine rooms, which had a fresco of coloured plaster. In the eastern section the remains of the *apodyterium* of a bathhouse were found (Stern 1993, 1139). Consisting of two phases, the building is well dated from the first century to the third century. The plan of the structure and the tactically unsound position, first noted by Frank (1934, 275), led the excavator, Cohen, to postulate a *caravanserai* role for the site.

However, Cohen termed another building in the area a fortress (Cohen 1982a, 243). This was located on a hill to the west of the main structure. It was 17 x 17m square and consisted of "11 casemate rooms around an open courtyard". Within these rooms were basins, crushing wheels and cooking utensils (Cohen 1982b, 165). Additionally, all three phases of the site produced reed baskets, olive and date pits, almonds and straw matting. Cohen found the remains of stairs in the eastern corner of the site that he thought led to a tower, which must count as the only defensive part of the whole site. The site was dated from the third to second century BC to the second century AD. However, it seems abundantly clear that the site is an agricultural one and assigning a military presence to it is difficult to argue.

## En Rahel and En Yahav

Ten kilometres north of Moyat Awad are the two sites of En Rahel and En Yahav (Figure 65, page 385). Both are reported to have Classical forts (Nahlieli & Israel 1982, 163; Tsafrir *et al* 1994, 122). En Rahel is said to be a road station on the way north to Ain Hosb. It consists of a 16 x 16m structure built around a courtyard, where considerable remains of organic material such as mats, baskets, almonds, and olive and date pits were found. It dates from the first century BC to the first century AD. Aside from its location on a prominent hill, it has no other diagnostic features to merit calling it a military structure. Also, it is unclear how the structure is associated with the main Arabah track and thus functions as a road station. The site of En Yahav is reported to have a fort with settlement and field systems but publication is minimal and does not allow for adequate review. The plan of the so-called *quadriburgus*

(Gichon 1980, 854 & 849, Fig. 56.3) does not demonstrate any military feature beyond a strong location and thick walls.

### En Hazeva

The oasis site of En Hazeva (Ain Hosb) is a major point on the crossing route in the northern Arabah from Qasr Tlah on the Jordanian side on a route (the so-called Ascent of Scorpions, Harel 1959) through Ain Hosb towards Kurnub (ancient Mampsis, modern Mamshit) and up towards Jerusalem. The site has been identified with *Thamara* of the *Tabula Peutingeriana* by Aharoni (1954) but this was rejected in Chapter 4 in favour of *Moleatha* of the *Notitia Dignitatum* (*ND Or.* 34.45) or Μοα (Moa) of the Beer Sheva Edict.

The site was first properly surveyed by Musil (1907–08 II, 207–208) and Frank (1934, 257–259, 279–280) who termed it a military site. This was confirmed by excavations in 1972 and 1987–90 by Cohen (Stern 1993, 593–594), although no final report has been published. The excavations established five layers of military structures dating from the Iron Age to the Early Islamic period (Figure 66, page 385). Stratum 2 and 3 produced evidence of Nabataean and Roman forts. The forts were built over the eastern wall of the Iron Age building. The Stratum 2 Roman fort was square in plan (46 x 46m) with four protruding corner towers. It was dated from the second to fourth centuries, mainly on the basis of coin evidence. The Nabataean period of Stratum 3 was dated first to second century and seems to be the earlier phase of this structure. The site has a clear a military function.

### En Tamar (Ain Al Arus)

The only other site north of En Hazeva (Ain Hosb) commonly assigned a military function is the site of En Tamar (Ain Al Arus ) which lies about 8km south of the Dead Sea on the northern route across the Wadi Arabah from As Safi in Jordan (ancient Zoar). The site was first noted by Rothenberg (1971, 215, Fig. 103) but excavated by Cohen in 1982 (Cohen 1984b, 201). Initially termed a *quadriburgus* by Gichon (1980, 852), Cohen subsequently showed it to be a *caravanserai* type of rectangular plan (30 x 40m) with rooms on all sides of the courtyard. Two occupation phases were noted spanning the first century and then the second to third centuries. Like Moyat Awad, a smaller structure was found on a nearby hill which Cohen presumed to be a fort. It was 20 x 20m square, of a courtyard type, and dated (admittedly on the basis of a small test pit) from the second to first century BC. However, as has been shown frequently in this chapter, the association of a square structure with a hill is insufficient evidence to assign military function.

On the basis of supposed textual references, the site has been identified with the ancient location of *Thamara* or *Thamana* where military units are stationed (recently Magness 1999, 190 Fig. 1) although, as Chapter 3 showed, *Thamara* is clearly the modern site of Mezad Tamar (Qasr El Juheiniye) which is further to the west of this site. However, the site has been equated in Chapter 3 with the Madaba Map reference to a towered building called "*praesidio*". Thus, one of the structures noted above may actually correlate with this attestation, but the lack of diagnostic archaeological evidence of military use should prompt caution.

### Mezad Tamar

Mezad Tamar (Qasr El Juheiniyie) was first noted by Frank (1934, 257–259, Plan 25) as a fort although he called it "kasr ed dschehenije". Kirk (1938, 221–224) examined the site several years after and confirmed Frank's observations and noted Nabataean pottery. However, the site was only excavated in the 1970s by Gichon who showed its full military extent (Gichon 1975, 1976, 1977 also Stern 1993, 1437–1440). As Chapter 3 clearly demonstrated, this site is equated with ancient *Thamara* which occurs in nearly all of the ancient sources citing military sites. The site is located on the eastern edge of the northern Negev Hills. It lies on the main track from Mampsis to the Wadi Arabah (Aharoni 1963). The site itself is a square fort (38 x 38m) with four corner towers (6 x 6m). There is a single entrance on the west face and the internal rooms, in all phases, are arranged around a courtyard, in the centre of which is a cistern (Figure 67, page 386). It is clear that it began as a large courtyard building to which four towers were added, although the excavator believes all the towers are contemporary with the main structure.

Gichon discerned four phases: 1) first century BC to second century AD; 2) last third of third century to second half of fourth century; 3) second half of fourth century and; 4) a small occupation following the restoration of Roman power in AD 624 until the Arab invasions of *c.* AD 635. In effect, the occupation lasted throughout the whole of Roman rule and had its roots in a Nabataean period building. Gichon's periods are clearly inspired by a historical framework and it is unclear how he could date the last period so precisely. In fact, the stratigraphic sequence of the site has been questioned (see Gregory 1997 III, 427–432) as Gichon's use of coin controlled contexts is insecure. He dated the beginning of the Phase 2 to a coin of the Emperor Probus (276–282 AD) from above (!) the floor of this phase. All this means is that the floor dates to before the deposition of the coin, not the inception date for the phase. However, for the purposes of this study it is sufficient to note that the fort was occupied for the duration of Roman rule.

## Wadi Arabah (Rujm Taba to Umm Et Tawabin, Jordanian side)

In this study it is argued that only one main road ran up the Arabah and it followed the mainly Jordanian-based military sites. This road would have continued from Yotvata and crossed the Wadi Arabah to join the next major military site at Khirbat Gharandal. Other tracks would have existed in the area, but it is argued here that the main route would have followed the major military sites, which were all placed next to springs or large water storage areas, as argued below.

This section describes the military sites on the Jordanian side of the Wadi Arabah moving from north of Aqaba to As Safi beside the Dead Sea. Kennedy's (2000, 193–203) descriptions of these sites have now become the standard reference for this area, despite their shortcomings. For instance, he seemed to be unaware of the valuable dating evidence from the surveys carried out by King in the 1980s (King 1985, 1987; King *et al* 1983, 1987, 1989) and the survey of Khirbat Faynan by Ruben (1996; Ruben *et al* 1997). It is argued here that some of Kennedy's entries should not have been described as forts and that others, which he omitted, should.

### Rujm Taba

South of Khirbat Gharandal, on the eastern side of the Wadi Arabah broadly opposite Yotvata, is the small site of Rujm Taba, which Kennedy assigned a military function (Kennedy 2000, 197). The site was first noted by Frank (1934, 238). Smith noted the site as part of his Arabah Survey, which is part of Parker's Aqaba Project. He took the first modern ceramic sample from the site (Smith & Niemi 1994, 478–479; Smith *et al* 1997, 57–58). The site lies 20m to the west of the modern road and nestles in the foothills of the mountains of the Jordanian Plateau. It lies close to another likely settlement site. According to the surveyors it is 21m² but it is unclear whether this means it is *c.* 4.5 x 4.5m square or (more likely) 21 x 21m square. Smith interprets the site as either a *caravanserai* or fort, which suggests the latter dimensions. He dated it to the Nabataean and Roman periods. On this basis Kennedy assigned a military function. As has already been shown, this type of site can be interpreted in many ways. To qualify as a military (or even *caravanserai*) site the presence of an ancient track must be demonstrated, which is not the case here.

### Khirbat Gharandal

The major military site of Khirbat Gharandal lies 22km to the north of Yotvata. The site has long been equated with *Arieldela* of the *Notitia Dignitatum* but, as was argued in Chapter 3, this is not the case and it is probably *Gypsaria* of the *Tabula Peutingeriana.* The site (Figure

68, page 387) is an important point as it commands a spring and a route up the Wadi Gharandal to the Plateau. First noted by Musil (1907–08, 193–197), the site consists of a fort (37 x 37m) with external square corner towers, a possible *caravanserai* building (B in Figure 68) and a reservoir and aqueduct (A in Figure 68). Kennedy (2000, 199, quoting Smith *et al* 1997, 59) notes the ceramic dates as Nabataean and Roman but, as King (King *et al* 1989, 212) showed, there was a full range from Nabataean to Byzantine. King provides the only tabulated range of ceramics from Gharandal and the date ranges of most sites in the following section follow his readings. However, it should be noted that, as his work was carried out in the 1980s, it still suffered from the methodological problems that were discussed in Chapter 5 (*i.e.* dating Nabataean wares to first century BC to second century AD). Unfortunately, there was no ceramic treatment of his work aside from the listed tabulation and a brief overview in King *et al* 1983, 417–418. Nevertheless, while the dating is uncertain, the site is accepted as a fort.

### Qa'a Es Sa'idiyeen

The existence of a possible Classical road, on the western side of the Wadi Arabah, further emphasises the importance of the military sites on the Jordanian side. Smith (Smith *et al* 1997) has noted the presence of an ancient road in this area. As with the *via nova Traiana* one would expect a full range of attendant road installations. Some sites along the Arabah (as has been noted on the Israeli side), instead of being seen as military structures, should be termed road-stations. One of these is Qa'a Es Sa'idiyeen, situated some 10km north of Khirbat Gharandal. Kennedy (2000, 199) lists it in his corpus and calls it a "fort". The site was first noted by Raikes (1985, 100) but was only properly surveyed by Smith (Smith *et al* 1997, 60-62) in 1993–1994. Smith dates the site to the Nabataean/Early Roman period but noted several Roman/Byzantine body sherds (Smith *et al* 1997, 60). Its position suggests it was located on the road leading from Khirbat Gharandal to Bir Madkhur, and the presence of a nearby quarry with broken milestones seems to confirm this. The site is a large rectangular structure (21 x 32.5m) with what appears to be rooms in the northern and eastern faces, which presumably face a courtyard (Figure 69, page 388). This type of plan, when encountered by DAS on the *via nova Traiana* (see Chapter 6), has usually been interpreted as a *caravanserai*/road station.

### Qasr Wadi Et Tayyiba

Eighteen kilometres to the north of Qa'a Es Sa'idiyeen is another similar site, Qasr Wadi Et Tayyiba. The site lies at the mouth of the Wadi Et Tayyiba (that leads up to Petra but which is not a main route) and is presumably on the Wadi Arabah route discussed above. The site

was first noted by Frank (Frank 1934, 230) who provided the only plan to date (Figure 70, page 389). The site was sampled by King who showed it had a ceramic range from Nabataean to Early Byzantine (King *et al* 1989, 212). Kennedy (2000, 199–200 Fig. 20.7) includes it in his corpus as a small fort or *caravanserai*. The site itself is rectangular in plan (25.5 x 25.5m) with rooms in the north, south and eastern sides. The entrance may be on the eastern face and leads into a courtyard. Thus, the plan corresponds to the *caravanserai* layouts that have been discussed already and means that the site is probably better associated with road traffic infrastructure.

### Qasr Umm Ar Ratam

The site of Qasr Umm Ar Ratam, lying 2.5km to the north-east of Qasr Wadi Et Tayyiba, was not included in Kennedy's discussion of military sites in the Wadi Arabah. However, Fiema (1995, 266 Table 2) included it in his corpus for his overview of military architecture in southern Jordan. It lies at the confluence of the Wadi Musa (leading to Petra) and Wadi Umm Ar Ratam. Frank (1934, 230), who calls the site Qasr Wadi Musa, provided the first archaeological survey of the site. King sampled the site and provided a date range from Nabataean to Byzantine with a later Ottoman occupation (King *et al* 1989, 212 11A). The site was subsequently extensively surveyed and planned by Lindner (Lindner *et al* 2000) who provided an excellent plan of the site, the surrounding landscape and communication routes (Figure 71, page 390). Lindner followed Fiema's military interpretation and securely placed the site within Fiema's (1991, 1995) model of control of internal security and economy.

However, while the site exhibits clear defensive measures, the military aspect is not clear. As one can see from Lindner's plan (Figure 71, page 390), there are three main structures: I – a small structure on the edge of the wadi, II – a small reservoir 14.5 x 13.5m with a conduit to it; and III –the main structure measuring over 22 x 26m. Structure III, termed the Qasr, clearly comprises three parts of which the earliest (A1) seems to be a large tower, 13 x 12m, which is constructed of well-made, embossed ashlar blocks (Lindner *et al* 2000, 548). These factors presumably have convinced previous surveyors to assign a military function. However, the site is also surrounded by extensive field systems and a small settlement (*ibid.* 549–554) and seems to be contemporary with the main site. As with many other such sites it is curious why a more prosaic civilian role is not posited here. The site clearly lies within a well-established, semi-arid agricultural landscape, and while the architecture is robust, it need not be militarily inspired.

## Bir Madkhur

Bir Madkhur is the next clear military site, lying on the road from Petra to Gaza at the foothills of the Wadi Arabah, some 8km north of Qasr Wadi Et Tayyiba. The site was first described by Frank (1934, 230), then properly sherded by King (King *et al* 1989, 212) who established a date range from Nabataean to Byzantine with some later Ottoman sherds. This was later confirmed by Smith (Smith *et al* 1997, 64). The site is presently under investigation (Perry and Smith 1998). Kennedy has postulated that the site was in use during the Nabataean period and then fell out of use until resurrected in the fourth century (Kennedy 2000, 201). However, King's ceramic sample would suggest that it was in use during the Roman period as well. The main fort is almost square in plan (32 x 34m) with external corner towers and a series of rooms around the inner walls (Figure 72, page 391). Nearby are the remains of several large structures and, in the wider landscape, the extensive remains of field terraces. Although Glueck (1935, 36) noted a possible reservoir to the south-east of the fort, this was questioned by Smith who noted partitioning inside the structure. There is an abundant spring at Bir Madkhur that may obviate the need for large-scale water storage. Smith suggested it was another large building, possibly a *caravanserai*, since the site was strewn with pipes and tiles denoting a bath complex (Smith *et al* 1997, 63–64).

## From Bir Madhkur to Khirbat Faynan

Between Bir Madkhur and the next major settlement in the area, Khirbat Faynan, no military sites have been discovered. A distance of some 30km, this gap in sites is surprising. This area was covered by the DAS in a field survey during 1998. Apart from DAS 345, a small single structure, no other sites were noted. However, the survey coverage was not extensive and one should not discount the possibility that there are more sites in the area. It may be that there was no official route between Bir Madkhur and Khirbat Faynan. The milestones noted by Smith (Smith *et al* 1997) close to Bir Madkhur, and those by Anver (1996) near Yotvata, may, in fact, relate to the official route outlined in Chapter 3, which would be marked by milestones and have a more formal road infrastructure including road stations.

## Qasr Namala

The only possible military site in this area is a small site, located on one of the side wadis that feed into the main Wadi Arabah. Qasr Namala is small rectangular site, 18 x15m, situated on the southern bank of wadi that leads down from a main path from Petra and Baydha (see Lindner *et al* 2000, 543–545). The site was first noted by Frank (1934, 228; Figure 73, page 392) as a possible fort, who recorded the presence of Roman sherds. The site

was not subsequently noted by other projects until DAS surveyed the site in 1998 (DAS 344). Aside from confirming Frank's plan of the site, DAS could not affirm his ceramic observations, as there were hardly any sherds around the site. The site has no military features but is not situated in an agricultural landscape. As it lies adjacent to a main track up to Petra the site may be a road station.

### Khirbat Faynan and area

Khirbat Faynan (DAS 63) and the surrounding areas of Wadi Faynan and Wadi Fidan represent a large area of settlement. The extensive agricultural systems and mines make it an extremely rich area of archaeological remains. Such large-scale settlement is made possible by harnessing several springs located further up the wadis towards the Plateau edge. Several main tower sites – Tell El Mirad (DAS 187), Abu Dhibana (DAS 190) and Rujm Fidan (DAS 186) – ring the western part of the wadi. DAS 186 and DAS 190, first noted by Frank (1934, 220–221, Plan 18), have been subsequently identified but were only considered to be towers. All three sites were sampled by King (King *et al* 1989, 211–212) who demonstrated that they were in use from the Nabataean to Byzantine period.

No military remains have been noted on the main site of Khirbat Faynan although Kennedy (Kennedy 2000, 201) included the site in his corpus of military sites on the basis of textual references to the coercion of slaves for mining, presumably carried out by soldiers. As part of the survey carried out by the British Wadi Faynan Project on the buildings of the main site, a sizeable square structure was noted on the top of the tell which may be a possible military site (Ruben *et al* 1997, 439, Fig. 3) (Figure 75, page 394). The building is about 30 x 30m square with rooms on all internal sides and an entrance (2.7m wide) in the south-west corner. As this area was fully surveyed by DAS a more comprehensive treatment will be given in Chapter 6. However, it is sufficient to note that no overtly Roman military structures have been identified in the wider area. However, Faynan is clearly mentioned in the Nessana Papyri and the Beer Sheva Edict as having garrisons (see Chapter 3).

### Khirbat Nahas

Frank noted a site, Khirbat Es Samra (1934, 219 Plan 16), in the Wadi Ghuweib (8km to the north-west of Faynan), which may have been a large rectangular fort structure (Figure 74, page 393). He could not identify any diagnostic ceramics but Fiema (1991, 296), following Abel (1933 I, 182), has suggested that the structure may be identified with a Roman military post. However, the site, now known as Khirbat Nahas, has been shown by trial excavations to belong solely to the Iron Age (Fritz 1996). However, one should note that King (King *et al*

1989, 209) showed the site had a range of pottery from Early Bronze to Early Islamic. Nevertheless, no Roman military presence can be posited.

### Khirbat Hassiya

The next major military site is that of Qasr Tlah, some 22km to the north of Khirbat Faynan. However, half way between these sites is another site that was not included in Kennedy's list, although in plan the building resembles others that have been classed as military sites. Khirbat Hassiya (DAS 189) was first noted by Frank (1934, 215 Plan 14; Figure 76, page 395) who noted Roman ceramics. Abel (1938, 181) saw the site as a probable candidate for the location of *Hasta* of the *Notitia Dignitatum*, but this was disproved in Chapter 3. This was borne out by the DAS sample, which provided only Roman ceramics. Frank described a site, 30 x 22m, situated by the edge of the Wadi Hassiya that had a courtyard plan with an entrance on the northern wall. There was a tower (6 x 7m) on a high ridge 40m to the east of the site. This acted as a lookout for the main site and also perhaps as a beacon for travellers across this flat area of the Wadi Arabah track. The site was subsequently surveyed by MacDonald who also noted Nabataean ceramics (MacDonald 1992, 273, Site 229). However, he did not note the existence of the tower and concluded that it was a *caravanserai* (MacDonald 1992, 86, 273 & Fig. 18). While MacDonald's assessment is the most probable, it is unclear why the site does not appear in either of Kennedy's or Fiema's military lists as it is broadly comparable to others such Wadi Et Tayyiba.

### Qasr Tlah

Qasr Tlah is the next major military site on the west side of the Wadi Arabah and is securely identified as the location of *Toloha* of the *Notitia Dignitatum* (See Chapter 3). The site is situated at the opening of Wadi Tlah where a spring feeds into an aqueduct leading to a large reservoir, built just to the east of the main fort site. The site lies on a major route across the Wadi Arabah, from the oasis of Ain Hosb (En Hazeva) in Israel which leads to Kurnub (Mamshit) and then on to Jerusalem. From Qasr Tlah the track leads up the Wadi Dahal to the Plateau top. This is a route of some importance and is more fully discussed in Chapter 6. The site was first noted by Musil (1907–08, 209–1214) and then by Frank (1934, 213–215, Plan 13). It has not been planned properly and MacDonald's recent survey only produced a schematic sketch (MacDonald 1992, 92 Fig. 19). The site is about 40 x 40m square with projecting corner towers. To the west of the site and stretching over one kilometre was an area of regular field system walls (now sadly destroyed) (Figure 77, page 396). MacDonald's survey produced a ceramic sample from Iron Age to Early Islamic (MacDonald 1992, 265

Site 155). This confirmed the evidence of King's survey that produced a similar sample, as well as some prehistoric sherds (King *et al* 1989, 209).

### Qasr Fayfa

Thirteen kilometres north of Qasr Tlah lies another important military site, Qasr Fayfa. The site lies on a broad open wadi plain of the same name several kilometres to the east of the modern town of Fayfa, which contains several other archaeological sites. Unfortunately, the area has been extensively bulldozed for modern agricultural fields and the sites are now lost. Frank (1934, 210–11) was able to survey the site and left two sketch plans of two large rectangular structures (Figure 78, page 397; Figure 79, page 398) that have always been presumed to be the outlines of Roman forts. Frank did not report any diagnostic pottery past a reference to ribbed wares, which may be the ubiquitous red Classical wares. These are Sites C and B noted on Kennedy's photograph (Kennedy 2000, 204, Fig. 20.12). Kennedy's Site A was noted by MacDonald as Site 75 (MacDonald 1992, 256) (Figure 80, page 399). This was the site surveyed by King as Khirbat El Fayfa (King *et al* 1987, 450). MacDonald's Site 77 (MacDonald 1992, 257), consisting of two small structures next to an aqueduct leading toward the Wadi Fayfa is situated next to Site C on Kennedy's photograph. This was next to the eastern of the two sites noted by Frank. The site was about 105 paces x 105 paces square and was composed of earthen banks which hid occasional stone walls (Frank 1934, Plan 11). Several hundred metres to the west of this was another similar structure (53 x 45m) which had some better-preserved walls on its western side (Frank 1934, Plan 12). It was one of these sites that Glueck referred to as a reservoir when he visited the area in 1934 (Glueck 1935, 10) when he also noted the remains of extensive field systems. If the sites follow the plan of those at Qasr Tlah, then the eastern site is most probably the reservoir and the western one is the fort. This is pure conjecture, but the existence of the two sites led Alt (1935) and others to postulate that this was the *Apud Praesidium* of the *Notitia Dignatatum*. It was reasoned that one of the sites was a police post (*Praesidium* in Latin) and that the other was a military one (hence the Latin term "near the Police Post"). This was questioned in Chapter 3 where the location refers to either of two sites on the Plateau. However, it is clear that a Roman military site of some size exists in the Wadi Fayfa, whether it be Site C or B.

### Umm Et Tawabin

The last major military location in this area, Umm Et Tawabin, is situated in the vicinity of the modern town of As Safi, which lies on the south eastern shore of the Dead Sea. In the Classical period it was known as *Zoara* and was the head of an administrative district

referred to in the Babatha Archive of the early second century (Lewis 1989, 21). Kennedy does not note any sites for this area but points to information from Eusebius and the *Notitia Dignitatum*, which refer to garrisons. However, Fiema included a large site above modern As Safi known as Umm Et Tawabin in his military list for southern Jordan. This site was first noted in the nineteenth century (although it was called Khirbat Labrush by Kitchener 1884, 216–217) and a sketch plan of the site was produced (Figure 81, page 400) which showed it to be roughly 345 yards wide and 470 yards long. Both Frank and Glueck do not refer to the site. King surveyed the site in 1982 and found it had a predominately Classical occupation with some Bronze Age and Middle Islamic sherds present (King *et al* 1987, 449, 457). MacDonald surveyed the site in 1985 and provided a ceramic sample from Nabataean to Early Islamic with some prehistoric material (MacDonald 1992, 249 Site 6). His plan is incomplete and only deals with the lower western segment of the site (*ibid.* 87, Fig. 17).

However, it comprises two main areas built on a large hill above As Safi. The upper area consists of a "citadel" where a large tower structure has a very commanding view over the Dead Sea. Leading south from this along a ridge are the remains of several structures which are all enclosed by a wall. A lower segment of the site exists on a wide ledge that surrounds the "citadel area" on the southern, eastern and western sides, which is enclosed by a wall over 2.5km long. Within this wall, on the western side, are the remains of many 2–3m diameter stone circles, which are plotted on MacDonald's plan. MacDonald postulated that they are the remains of stone bases for tents (*ibid.* 86). Umm Et Tawabin is a highly important site in the area but it is unclear if the units listed in the sources occupied this site. Without further detailed archaeological survey it is impossible to speculate. However, the lack of other military sites in the As Safi area (beyond small towers) strengthens this identification as the location of a military unit.

## Conclusion

Over 55 sites in southern Jordan have been previously interpreted as having a military role. The analysis in this chapter clearly shows that much of the evidence for military function is over-interpreted in many cases. This is especially so with regards to so-called monitoring or communication networks of towers during the later Roman period. In both cases, the surveyors ignored ceramic data that could have pointed to the existence of such a system in any period. Moreover, they ignored the evidence of site morphology that clearly pointed to several possible interpretations of site function. Indeed, many of the sites in this review are more properly seen as part of the wider state road infrastructure.

This review established that there are 24 sites in southern Jordan and the Wadi Arabah that can be classed as military (Figure 82, page 401). These are listed by date and site size in Table 14 (page 402). Of these, two are unclear. Umm et Tawabin, near Safi, and Ar Ruweihi, on the desert edge, do not correspond to the highly regular plan of Roman forts although they are clearly occupied during this period. The presence of a Roman fort in Aqaba is also unclear. While the textual evidence in Chapter 3 shows there was a legionary base there in the third century, the archaeological definition has not yet been fully demonstrated. Similarly, the definition of fort for Khirbat Faynan is questionable. Nevertheless, the overall results shown in Table 14 (page 402) confirm the textual evidence that shows military location is both conservative and lengthy. Of the 24 sites identified, 19 were occupied in the Nabataean period rising to a high of 21 in the Late Roman/ Early Byzantine period, with only nine occupied in the Early Islamic period. The four new sites in the Late Roman period are El Lejjun, Qasr Bshir, Khirbat Dajaniyah and Udhruh. However, it should be noted that data from these sites comes from excavated material while the majority of the other data comes from survey data.

Nevertheless, the pattern of specific eastern expansion by Roman military sites is significant. While this may strengthen Parker's (1986a) view of a defensive line, the overall framework of these sites must be borne in mind. The expansion only occurs in a specific area and accounts for only 16% of the total number of sites in Table 14 (page 402). As can be seen from Figure 83 (page 403), site sizes are significant too. There is a clear hierarchy of site sizes, with usually one major site in each area. Thus, El Lejjun predominates on the Kerak Plateau while Udhruh is dominant on the Jibal and Shera'a plateau. Below Udhruh are the two clearly subordinate sites of Dajaniyah and Sadaqa. In the Hisma, Humayma is clearly the major site. In the Wadi Arabah there is a large fort at either end of the route, although, in the north it is unclear if it was Umm Et Tawabin or Qasr Fayfa. The lowest level of forts are clearly small posts along routes in the Hisma and Arabah. The site sizes of this level in the Jibal and Shera'a are noticeably larger than those in the semi-arid area.

This hierarchy clearly points to an overall system and not one associated with a single line. However, this system is clearly rooted in a Nabataean tradition and thus the imposition of Roman rule is not discernible at the archaeological level. Indeed, previous scholars' opinions about the lack of garrisons in the second century (*e.g.* Lander 1986) are quite erroneous. This system was clearly attached to the road system of the Wadi Arabah and the Plateau and does not demonstrate a correlation with internal security linked to settlements. The eastward expansion of sites observed in the north-eastern part of the study area may at first glance

appear to be a push into the desert but, as in the case of Dajaniyah, the push from the earlier garrisons on the *via nova Traiana* is only 5km in places. This does not appear to be the dramatic push into the desert that Parker proposes. While Parker correlates these sites with the historical appearance of nomadic threats, it is not clear why this would occasion such a slight movement of forts. Certainly the scale and nature of these forts is significant but their correlation with systems of defence as defined by Parker does not tally with the overwhelming textual evidence of Chapter 3 and the archaeological evidence presented in this chapter. Rather, it points to a tradition of strong association between fort locations and major communication routes.

# Chapter 5

## Dana Archaeological Survey: research background, methodology and ceramic analysis

### Introduction

This chapter sets out the aims, research strategy and methodology of the project that furnished the primary data for this study. The Dana Archaeological Survey (DAS) was a three-year field project studying resource control and state organisation from the Iron Age to Ottoman period in the Faynan, Dana and Shaubak areas of southern Jordan (Figure 2, page 316). The aim was to produce a record of the spatial relationship of state/military sites and settlements within a landscape setting of resource areas and communication routes. The project recorded over 400 sites over a 1750km² area, taking over 300 ceramics samples containing *c.* 21,500 sherds. The locations of all sites are contained in Figures 84–92 (pages 404–412). The description of individual sites is appended as a gazetteer in Appendix 1. The results of the ceramic analysis are in Appendix 3. The research strategy, field methods and preliminary results are presented here with a critical review of survey methodology. Finally, the ceramic chronology, methodology and preliminary results are presented.

### Project background

#### First phase: CFA project

The DAS project grew out of a commercial field project, undertaken by the Centre for Field Archaeology (CFA), University of Edinburgh, as part of the Royal Society for the Conservation of Nature's (RSCN) GEF (Global Environment Facility – World Bank) project (Findlater 2002, 137–138). This was a field survey of the RSCN Dana Nature Reserve in southern Jordan. Two seasons of survey were undertaken in 1994/5 and 1996 to establish a baseline archaeological component for the Dana Nature Reserve management plan. The results of the main 1994/5 survey were reported in a CFA Technical Report for the RSCN (Finlayson & Baird 1995). The 1996 survey completed checks on the earlier survey and added new sites to the original corpus but it was not reported on. The 1994/5 and 1996 projects carried out intensive pedestrian surveys of six areas in the reserve (Figure 2, page 316).

This survey of the Dana Nature Reserve was designed to provide the RSCN with data for their baseline heritage assessment. The RSCN brief included the assessment of sites with

tourist potential, an assessment of the range and nature of the various sites, and a consideration of the environmental impact of past human activity on the landscape. Within the constraints of this preliminary survey the first two aims of the brief were achieved. The third aim requires more detailed investigation.

### Second phase: Dana Archaeological Survey (DAS)

The second phase, the DAS, incorporated the CFA project data. The aim of this project was to provide a suitable dataset to test the propositions of this research. As such, three seasons of field survey were carried out in 1998, 1999 and 2000. Two seasons of ceramic analysis were carried out in 1999 and 2000, following the field seasons.

As the overall aim of the project was to document sites within a resource control landscape, certain specific objectives were identified: (1) to document and reassess known sites recorded by previous projects; (2) to carry out rapid survey of the project universe (3) to locate all routes in the project universe and prospect for evidence of ancient routes; (4) to establish the nature, date and function of the sites; (5) to elucidate fully the nature of resources present during the research period; and (6) to integrate and analyse this data in an historical and archaeological landscape setting.

The first objective was attained by a combination of desktop and field survey throughout all of the DAS seasons. The previous research publications used in this survey are listed in the next section. Using these works all previously visited sites were re-surveyed. Objectives 2 and 3 were carried out in conjunction and thus there is a bias towards sites located in the corridor of the routes identified. Objective 4 was achieved by taking artefact (mainly ceramic) samples from each site where possible and recording, either by sketching or mapping, salient site morphology and architectural features. Objective 5 was achieved by correlating historically known resources and information derived from local people through selected interviews. Objective 6 is achieved mainly in this study, although all data (including prehistoric and later Islamic) will appear in the final report (Findlater *et al* forthcoming).

## Research background

As Field Director of the original CFA survey, it became apparent to the author that previous archaeological surveys had not adequately described or realised the significance of the monuments in the area. Previous research in the Dana/Faynan area had revealed the massive exploitation of copper resources from the Bronze Age to Roman period (Kind 1965; Hauptmann & Weisgerber 1987, 1992; Hauptmann 2000; Levy *et al* 2002). However, the control and management of such a valuable resource, and its relationship to two of the major

trade and communication routes in the area (namely the Wadi Arabah and King's Highway), had not been studied in any depth for the Classical period (Findlater 2002, 138). Indeed, the wider impact on settlement hierarchy in the area has been barely touched on. Although the areas of the Faynan region were extensive and contained the largest copper mines in the Roman Empire at Umm El Amad (Hauptmann & Weisgerber 1987, 1992), a study of the military, socio-economic and political dimensions of the mines has not been attempted. In the southern Wadi Arabah, on the Israeli side, Rothenberg (1971, 1972) has documented the copper mining of all periods and provides some social context. However, studies of the Faynan area have focussed on the technological aspects of mining and do not attempt any further comment except to provide a historical development of the mines (Hauptmann 2000; Hauptmann & Weisgerber 1987, 1992). This is in direct contrast to the extensive work carried out on the nature of copper exploitation and resource control during the Early Bronze Age in this area (Adams 1998, Wright 1998; Levy *et al* 2002) (Findlater 2002, 138).

## Previous fieldwork

Archaeological research in this area is characterised by regional surveys relying on surface remains and ceramic data for the reconstruction of settlement history. Several sites have been excavated in the area (detailed below) but they have not provided a lengthy stratified sequence. The lack of such a sequence severely hinders the precise dating of surface ceramic data from surveys (see Fiema 1995, 264 & Schick 1994 for the problems with the better known Roman/Byzantine ceramics). This is a feature of research of most periods in southern Jordan. Additionally, there has been no regional investigation into the palaeo-environment.

Until recently, little systematic archaeological survey had been undertaken in this area of southern Jordan. Musil (1907–08) and Brünnow & von Domaszewski (1904, 1905) documented highly visible remains along main routes or presumed Roman roads. Glueck's surveys (1934, 1935, 1939), although much more detailed, were highly purposive and biased towards his reconstruction of the Edomite Kingdom. Bennett carried out excavations at the site of Buseirah that, as *Bozrah*, was the capital of the Edomite Kingdom (Bennett 1966). Killick's (1983a, 1983b, 1986, 1987) survey and selected excavations of a large area between Shaubak and Ma'an have not been published except for a few sites in the immediate vicinity of the large military site of Udhruh (*ibid.* 1983a, 127–131). Hart's survey of an area to the west of Killick's project area focussed on the Iron Age and was highly purposive as he sought to demonstrate any connections between the Iron Age and Nabataean periods (Hart 1986a, 1986b, 1987; Hart & Falkner 1985). Parker surveyed the major Roman/Nabataean sites to the east of the *via nova Traiana* as part of his Limes Arabicus Project to reconstruct

the changing frontier systems of Rome (Parker 1986a). Fiema surveyed a section of the *via nova Traiana* to the north of the DAS area (Fiema 1993), while Graf surveyed the sections to the south of Shaubak in his extensive study of the *via nova Traiana* in southern Jordan (Graf 1995). In 1997 Walmsley began a project investigating the site and environs of Gharandal (ancient *Arindela*) to investigate the nature of the Early Islamic period (Walmsley 1998, Walmsley *et al* 1999, Walmsley & Grey 2001). Similarly, in 1999, MacDonald began a survey project extending his Wadi Hasa Survey to the south, from Buseirah to the Desert Highway area (MacDonald 1999, 2000b) (Findlater 2002, 137). Peterson has recently carried out a small excavation at the Hajj fort of Qala'at Unaiza (Peterson 2003).

In contrast, the Faynan and Fidan, in the Wadi Arabah areas, have been the subjects of intensive work as part of the CBRL project in the Wadi Faynan area (see McQuitty 1998) (Findlater 2002, 137). For the Classical period there has been the excavation of a large Byzantine cemetery (Findlater *et al* 1998), while Freeman has carried out a survey of a "suburb" area south of the main settlement site, Khirbat Faynan (Freeman & McEwan 1998). The main site of Khirbat Faynan has been mapped and an accurate plan of the surface features produced (Ruben 1996, Ruben *et al* 1997). A large area of field systems, dating mainly to the Classical period, to the west of the Khirbat Faynan has been intensively recorded by Barker over several seasons (Barker 2000, 2002; Barker *et al* 1997, 1998, 1999, 2000). There has also been intensive exploration of the prehistoric periods. Raikes carried out a series of surveys around the Wadi Fidan area which produced a number of important Neolithic to Chalcolithic sites (Raikes 1980, 1985). A Neolithic site has been excavated in the Wadi Faynan (Najjar *et al* 1990) and a Bronze Age landscape has been discerned underlying the classical field systems (Wright *et al* 1998). Finlayson and Mithen have investigated the earlier prehistoric settlement patterns in the wadis leading up to the Plateau through survey and excavation (Finlayson *et al* 2000). Simmons has carried out an excavation at the Neolithic settlement at Ghuwair, south of Khirbat Faynan (Simmons & Najjar 1996). However, a major focus of research, undertaken by Levy and Adams, has been to investigate through survey and excavation the sites found by Raikes in the Wadi Fidan (Levy *et al* 1999, 2002) which built on an earlier project by Adams (1992, 1998). In the wider area, King and MacDonald have carried out purposive surveys in the Wadi Arabah (MacDonald 1992; King 1985, 1987; King *et al* 1989), following Glueck (1934, 1935) and Frank (1934) (Findlater 2002, 137).

## Resources and routes

As noted in the introduction, the work done by the Deutsche Bergbau Museum, demonstrated the massive reserves of copper exploited in the Faynan area (Hauptmann & Weisgerber 1992, 65). Their work showed that copper extraction was important in the Iron Age and Roman periods. Extensive oak forests are supposed to have covered the Plateau area. In the last century the Ottomans built a branch of the Hejaz Railway from Unaiza to Shaubak to exploit this resource. In fact, in his survey, Glueck (1935, 89) comments on the stumps of trees left by this process. Water systems, such as springs, dams etc., are also vitally important in an area where rainfall is low. Perennial springs, usually situated on the edge of the Plateau, provide much of the water in the area and are a focus of settlement throughout all periods. For this reason cultivation is usually limited to a thin strip along the western edge of the Plateau. The limited viability of rain fed agriculture meant that massive field systems were established in semi-arid areas where fields are fed by water run-off. Such systems occurred in the Faynan, Tlah and Udhruh areas (Barker *et al* 1999, 269–278; Kennedy & Riley 1990, 207 fig. 158; Killick 1986, 438)

In addition to these natural resources, one should consider the trade and communication routes that ran through this area (Figure 2, page 316). The main route through the Plateau is the King's Highway that runs along the western edge of the Plateau linking most of the settlements. Similarly, the Roman road – the *via nova Traiana* – in parts follows this road in the south of the area but departs from it to the north where it is situated to the east of the King's Highway. To the east are the routes that are now covered by the so-called Desert Highway and the Hejaz Railway. Traditionally this route was the Hajj route, along which a series of forts were established to protect and aid pilgrims in the Islamic period (Peterson 1989). It would seem from Brünnow & von Domaszewski (1904, 1905) and Parker's (1986a) surveys that these routes were also used during the Classical period. The Wadi Arabah was also used as a trade and communication route. However, many east-west routes linked the Plateau with the Wadi Arabah and across to Palestine. The main routes were the Wadi Dana and the Wadi Dahal. Local people commented that up until 1948 the Wadi Dahal route was used by traders from Ma'an crossing at Qasr Tlah to Ain Hosb in Palestine, which was the shortest cross-Wadi Arabah route in the area (see Horsfield & Conway 1930, 372).

## Field methodology

### Introduction

This section will discuss and evaluate the field methodology used to cover the terrain and define sites in the DAS project universe. It will also outline the types of sites encountered. It must be remembered that the first project undertaken by the CFA was designed as a baseline exercise to survey intensively a small sample area and estimate the range of monuments that may be encountered in the Dana Nature Reserve. Thus, its methods and aims were quite different from the DAS project.

### Research area

The project universe of the CFA survey was limited to the Dana Nature Reserve, which is an area over 200 km². The reserve is located 200km south of Amman and 50km north of Petra within the Tafilah Governate. However, the universe of the DAS project incorporated the earlier CFA project area and took in a large section between the Wadi Arabah in the west and the Desert Highway on the Plateau to the east (Figure 2, page 316). In the north it was bounded by the Wadi Dahal and the Gharandal to Jurf Ed Darwish road. The southern boundary was delimited by the Wadi Arja on the Shera'a Plateau. This covers an area approximately 1750 km². This area not only encompasses Jordan's two major trade and communication routes but also contains a variety of natural environments from Mediterranean to semi-arid, ranging in elevation from -100m to 1500m above sea level. Such variation means that diverse settlement sites and resources are contained within a relatively finite area. Furthermore, the research area was known historically to contain massive natural resources such as timber in the upland plateau areas (Shaubak etc.) and copper in the Faynan areas in the Wadi Arabah. These routes and these natural resources form the basis of the resource areas exploited, maintained and taxed by states. Due to the presence of major wadis that deeply dissect the steep scarp on the western edge of the Plateau, travel between the Wadi Arabah and the uplands is fairly easy (Findlater 2002, 137).

The project universe was divided into five main regions for analytical purposes. These are the Wadi Arabah, Jibal, Shera'a, Desert and Ma'an (see Figure 2, page 316). The first four represent clear environmental divisions that mirror the wider areas of southern Jordan as outlined in Chapter 1. The Ma'an sites, although correctly within the Desert region of this study, were outside the main project universe and represent a unitary complex.

## Map coverage

The project universe covers an area approximately 1750 km² for which the cartographic record is variable. The best coverage of the area is the 1:50,000 series (K737) produced by the US Army Topographic Command from 1968 onwards. The best larger scale map is the 1:25,000 series compiled by Hunting Aerosurveys Limited (1953) on the Palestine grid system. However, as this series does not cover the western end of the survey area, the 1968 series was adopted as the base for the DAS survey maps. These are Sheets 3050 I, 3150 IV, 3150 I, 3051 II and 3151 III, 3151 IV, 3051 I, 3151 IV, 3151 I. They form the base maps of sites in Figures 84–92 (pages 404–412). As far as possible, all sites were located using a Magellan GPS system. The co-ordinate system used was the Universal Transverse Mercator. The datum used for the GPS was WGS 84, Zone 36.

The names of modern towns were taken from the 1:50,000 maps. However, many of the names of mountains and wadis on official maps do not match those used by local people. Similarly, some site names taken by Glueck and Frank in the 1930s do not match those used today. Partly, this is due to tribal movements – there are now different people living in the area. However, while some monuments have a specific name attached to them, others lie within a named area of the village lands. Thus there could be several ancient sites in one area all with the same name. This can create problems when comparing earlier surveyors' work. This is further complicated by previous surveyors giving newly discovered sites their own "Arabic" names. This practice should be discouraged as a great deal of confusion can ensue. Where DAS encountered a new name for a site or variant, it was only confirmed after three separate local attestations. However, as only some of the members of the survey team spoke Arabic, the transliteration of Arabic names is uneven but broadly follow the guidelines laid down in *Levant*.

## Site definition

The definition of sites in the CFA seasons1994/5 and 1996 seasons was quite different from the subsequent DAS seasons. The brief from the RSCN called for an investigation of all forms of human occupation. Thus, any man-made material or alteration of natural resource was considered a site. This included artefact scatters, camp areas, caves, field walls/terraces, stock enclosures, water storage systems and graves, as well as built habitation structures. However, artefact scatters representing sites were difficult to distinguish from low density scatters of material found in fields as a result of manuring etc. In such cases a subjective, site by site approach was employed.

The operational definition of a site in the DAS seasons was deliberately limited to upstanding remains associated with habitation and movement. This was to enable a greater concentration of sites that could be correlated with human behaviour within an imperial landscape of resource exploitation. This meant that the survey adopted prospection type methods where spatial structures of sites were the determining factor. However, this meant that site morphology was not the only criteria for site definition. Site definition was highly contextual, as sites spatially associated with communication routes or clustering around natural resource areas were the primary focus. This meant that site definition could be highly flexible and occasionally other man-made features were surveyed.

### Site conditions

Unfortunately, there has been much development of the area since the 1930s when Glueck (1934, 1935, 1939) and Frank (1934) surveyed the area. In the late 1960s (probably after the 1967 War) there was a great increase in population. With the consequent boom in building many new villages emerged. Most were along the Plateau edge and took advantage of the improved road (and attendant water and electricity) system. Thus, the new village of Qadisiyah, which lies above the older village of Dana, destroyed several Classical remains in the area. This pattern was repeated along the whole Plateau. Where sites survived, many were quarried for stone for building. This process was controlled as it was carried out under licence from the Department of Antiquities. However, this would have an effect in comparing pre-WW2 surveyors' site descriptions.

The improvement in the modern road infrastructure, aimed at linking the main port of Aqaba with Amman and providing easy access to the main tourist site of Petra, has been even more destructive. Recent attempts to upgrade the Desert Highway to Petra road have resulted in the widespread destruction of the *via nova Traiana* which lies on exactly the same route. In other areas, the *via nova Traiana* has been destroyed by various construction projects and most milestones have been knocked over in a vain search for "Ottoman" gold. Similarly, the construction of the main Desert Highway, along the route of the Hajj pilgrimage, has clearly destroyed many attendant Islamic and possibly earlier sites. Improvements in agricultural techniques and the ability to sink deeper wells has meant that more areas of land are being heavily developed. Thus the Shaubak region, where there were no previous archaeological surveys, has numerous large areas devoted to fruit farms. At the most basic level, many farmers have access to large plant machinery such as bulldozers etc., and the landscape is scarred by attempts to clear sites from the land.

However, site visibility and condition within the project universe is very good. The relatively late development of the landscape has meant that there are still large areas which have not been modernised. The widespread availability of good building stone and, in the Plateau areas, the need to protect against the wind and snow, has meant that sites were solidly constructed. In areas away from modern villages the height of wall preservation is very impressive. This has meant that site morphology can be very pronounced and the mapping of many sites relatively straightforward.

## Survey coverage

In all seasons of the DAS project the terrain was covered by both pedestrian and vehicular methods. However, pedestrian methods did not follow formal sampling techniques as used by Banning in the WHS project (MacDonald 1988). Usually only selective areas were covered by walking by transects or traversing the area. The distance between surveyors for transects varied according to the size of the site or the area to be covered. In general, the CFA surveys attempted to cover all the sampled areas and transects widths were smaller. However, the DAS research objectives were more focussed as only certain high-visibility sites within the landscape were pinpointed. Thus, vehicular methods were usually more effective. This is especially so in the more open desert areas and in the rolling countryside of the Plateau area where large sites are easily noted through binocular sweeps or with the naked eye.

During the CFA seasons of 1994/5 and 1996 coverage of the sample areas was intensive. Following discussions with the RSCN in the field, six areas were identified for intensive field survey. These areas focussed on RSCN tourist proposals around Dana village and camp, and to provide samples of the diverse settings to be found within the reserve boundaries (Figure 2, page 316). The survey areas were covered using either a pedestrian transect method or by traversing the area. Transects were found to be better suited to more open areas devoid of topographic boundaries. To achieve the required coverage of such large areas, the distance between field surveyors in the team walking the transects varied from 10m to 70m. Visibility of structural remains or artefacts was not a problem. In the eastern areas, however, the ground was generally covered in grass, which hindered the identification of artefact scatters. In general, most of the area noted above was covered using pedestrian methods.

In contrast, the DAS research framework called for the location of new military/state sites and the delineation of road networks. Thus the coverage was directed along quite specific routes and also over a much broader area. This allowed the project to document existing and

new sites rapidly within the framework of the research strategy over a large area. Within this limited view of site definition, visibility of remains was very good. Settlements, towers etc., were visible from up to two to three kilometres away. Sites were located by employing purposive vehicular and pedestrian survey methods. The upland Plateau and the Wadi Arabah, traversed by numerous tracks, allow the successful use of vehicular methods. However, the deeply dissected scarp of the western Plateau could only be surveyed by foot. Both techniques used the skills and knowledge of the local people to locate sites, especially water resources no longer in use.

As noted above, the DAS project universe was divided into five main areas (see Figure 2, page 316). Survey coverage varied between each area. Parts of the Jibal area had already been partly sampled by the CFA survey. However, this area was extended to the Desert edge where the whole area was covered using vehicular methods, and a detailed survey of roads was carried out using pedestrian methods. The Shera'a area was covered using methods similar to those employed in the Jibal area. The heavily dissected areas below the Plateau edge could not be covered fully as the appropriate pedestrian methods for this are very time consuming. The Arabah survey concentrated only on the corridor of the supposed main route of the ancient road system. However, a broad corridor was surveyed between Khirbat Faynan and Jabal Hamrat Ifdan. The coverage of this area was achieved by vehicular methods. In addition, cross routes from the Arabah to the Plateau (Wadi Dahal, Wadi Dana and Wadi Hammam) were covered using both vehicular and pedestrian methods. The Desert area was similar to the Arabah in that the survey concentrated on the corridor along the route of the modern Desert Highway and the older Hajj route. In the open areas of the Desert only vehicular methods were used. The Ma'an sites were surveyed on foot for specific sites and by car for the extents of the landscape features.

### Field recording

The recording and sampling system followed the original CFA surveys. Recording was carried out on pro-forma sheets to document the nature and features of the site. However, extra features were also systematically recorded on the forms: field of vision, intervisibility with other sites, proximity to resources such as water etc. This was especially beneficial when documenting sites that were presumed to have had a military function. Detailed mapping of all sites was not attempted except at sites such as forts etc., which were identified through the research framework as key sites. 3D site location, on the UTM grid plotting on 1:50,000 maps, was undertaken with a Magellan Field Pro V GPS. All sites, fields of vision/intervisibility and routes were recorded photographically. Additionally, a

basic interview procedure was devised to question the Bedouin and settled peoples about their use of the landscape for travel, communication and resource exploitation. This was of value when interpreting sites in the landscape and provided information about old routes to Palestine and water supplies no longer in use.

## Site types

The primary reason for dividing the sites sampled in this study was to provide interpretative types. This was to allow material correlates for analysis within the research framework. The operational definition of a site in the DAS project had already focussed on upstanding remains as the main criteria for initial samples. This followed the assumption that state/military activities are more observable at this scale of human activity. Of course, this does not represent the gamut of human activity in a military landscape, but it does provide the first directly observable step in the analysis of the imperial material landscape.

The interpretation of site morphology to provide functional types is a highly fraught affair. The use of buildings can change over time while retaining the same plan. For this reason many archaeologists assign functional divisions on the basis of surface artefacts using notions of richness and diversity (*cf.* Wenke 1975–76, 1987). This method is mostly used on tell sites with no observable architecture, while most survey projects in Jordan of the Classical period use surface artefacts for dating purposes. This is partly due to the research framework of most survey projects, including DAS, which focus on purposive artefact sampling techniques that cannot be used for quantitative analysis of artefact types and variety.

However, due to the good preservation of most sites on the Jordanian Plateau, the primary interpretation is achieved through surface architectural plans. The widespread use of stone buildings in the project area, along with the high preservation of walls, means that surface plans derived from either a sketch or detailed mapping can produce a detailed layout of a site. The interpretation of sites on the DAS usually followed two broad lines. The first was purely descriptive, for example, single structure or wall etc. This was interpretation at a very basic level and had limited analytic use. The second approach attempted a higher order interpretation that produced more functional types, such as fort, road station, and *caravanserai*, which are more suitable for analytical use. However, this based the interpretation solely on site morphology. As has been emphasised above, the landscape context of a site can contribute as much to site interpretation as the plan. This is most clear where certain rectangular structures occur along known roads. For example, when these

occur in a purely agricultural landscape they are usually thought to be farmsteads. However, when they occur along the route of a road they are usually termed road stations.

The DAS divided sites into two broad categories. The first was termed built structures. These are the sites associated directly with human habitation. These accounted for over 60% of the total site numbers. However, the rest of the sites sampled were associated with movement, burial, temporary habitation or agricultural exploitation. These types are listed in Table 15 (page 413). The 60% Structural type will be discussed below as these sites are more directly correlated with the primary focus of state activities discussed above. Most of the remaining 40% of sites were identified in the CFA 1994/5 and 1996 seasons when site definition was much broader. However, key types such as walls, roads and field systems were surveyed in association with many of the structural sites.

Road and ancillary features refers to built tracks of stone paving or an area enclosed by two parallel walls. Ancillary features denotes parts of roads that have been buttressed or have water deflection walls. Mortuary sites are mostly burials but some sites are built tombs. They can include cemeteries attached to settlement sites. Artefact scatters were recorded based on a visual impression of the density of artefacts. Enclosures were circular to sub-rectangular built walls occurring singly in the landscape. These features occur within settlement or farm sites but were not recorded separately. Campsites are areas distinguished by a density of hearths and can occur with artefact scatters. Water structures is a general heading for a variety of water storage facilities and conduits. These are cisterns, dams, channels and aqueducts. The caves noted by the DAS were clearly altered by human occupation, distinguished either by blackened roofs or carved features within the cave interior. Field/terraces are either areas of fields fed by irrigation or terraced fields using the hillside to direct the water. Walls are long, low, linear rubble walls that occur in this landscape as boundary markers. Carved features are cupmarks or games carved in the natural rock. Graffiti are the tribal markers (called *wasim* in Arabic) left on the wadi side to denote the passage of groups. Mine is a self-evident type and is the general term for the groups of copper mines in the Wadi Faynan area.

The second level of structural type is assumed to have a direct relationship with human occupation. When correlated with the ceramic samples they are used as the basic index of settlement rise and fall. However, within the landscape models outlined in Chapter 2 the spatial as well as chronological correlation is emphasised. The DAS project divided the structural types into 7 main types. Of these, two were not analysed in the present study as they are later Islamic shrines or Christian churches. They are clear twentieth-century sites

such as Turkish WW1 trenches. The remaining five groups are single structures, towers, farms, settlement and state sites. State sites are forts, *caravanserais* and road stations. The review of Chapter 4 clearly showed a particular type of Roman fort in the landscape that was of regular plan and had corner and mid-towers (Gregory 1997, Lander 1984, Kennedy & Riley 1990). However, the definition of *caravanserais* and road stations depends on the spatial context of the site. *Caravanserais* are large rectangular sites composed of a series of regular rooms around a spacious courtyard. They are located on major routes and acted as lodging places for the night. Road stations are much smaller sites of rectangular size but lacking a large courtyard. Both these site types can be variously interpreted as farms in an area of agricultural land and not associated with a known route. Settlements are many structures (usually counted as more than three separate structures) located in a concentrated area, which means quite a variation in size. As the DAS project concentrated on material correlates of state resource control, it was only necessary to characterise the settlement component. Farms, in this instance, are defined as rectangular buildings of regular layout, usually surrounded by areas of enclosure and field systems (*cf.* Hirschfield 1997, 1998). They can be similar in plan to road stations. Towers are usually characterised by very thick walls and restricted floor space and are more than one storey high (Dar 1986; Routledge 1996, 247–271; Banning 1992). Single structure is defined as 1–3 small single structures in any landscape. It is difficult to assign a more secure function.

The overall figures for these sites are listed in Table 16 (page 413). As one can see, single structures form a high percentage of the sample which limits an overall interpretation of the landscape. However, the other types are sufficiently present to form an overall characterisation of the settlement pattern. These site types were entered into an Access Database to correlate with the ceramic readings from the field samples.

## DAS ceramics

### Introduction

The DAS survey collected ceramic samples from all sites for dating purposes. This section will discuss the methodology and initial results of the ceramics analysis. In doing so, it will review the assumptions behind the validity of surface artefact analysis. The field methodology for the retrieval of samples will be outlined with a description of the initial sorting of ceramics into various types. Finally, the ceramic parallels and results will be presented.

## Background

In the Levant the use of surface ceramics to demonstrate a site's chronological span has been a common method in archaeological survey since the 1920s. This method of using ceramics is classed as Analytical Historical where material culture is sorted into a series of successive stages (Adams & Adams 1991, 216–217; also Adams 1979). Before this period, site morphology was used more extensively as a dating aid. However, after Petrie successfully demonstrated the use of seriation models to date ceramics at Tell El Hesi in 1890, it became apparent that ceramics were capable of being given fine chronological distinctions. When Petrie's students (such as Bliss) began to work in Palestine, his techniques were employed in the excavation of large tell sites. These excavations showed the considerable longevity of tell sites and established ceramics as the prime dating agent.

Albright (1932b), through his excavation at Tell Beit Mirsim, began to develop Palestinian pottery sequences, which he applied to the survey of sites. This was seen as a cost effective way of checking for a particular period in a site's history. For example, it was regarded as useful when attempting to locate Iron Age sites to check Biblical stories. More importantly, however, Albright's (1932a, 85) methods were applied to Jordan by Nelson Glueck (1934, 3) in series of massive surveys carried out during the 1930s. The significance of these has been discussed in Chapter 2, but the methodological revolution will be emphasised here. By applying Albright's methods, Glueck was able to establish a clear archaeological history of Jordan which held sway until the 1970s (Sauer 1986b).

Glueck did not independently test Albright's methods in Jordan but was content to adopt his techniques (and assumptions) wholesale. In particular, although tell sites are relatively rare in southern Jordan, he still used them as the model on which to confirm Albright's theory that surface ceramics correlate with a site's history. Borrowing a very dominant 1930s image, he likens tell sites to skyscrapers, where each level of the skyscraper equals one cultural period of a tell (Glueck 1970, 25). This was the dominant model in excavation methodology that sought to define broad layers across a site as correlating with historical periods.

However, the idea that surface ceramics could achieve a similar, if less exact, result was quite revolutionary. Glueck saw the justification for this in rather crude geoarchaeological terms: "As the winds blow or the ruins wash soil away from the surfaces of a mound, thousands of fragments of pottery of usually all the pottery periods represented in it are exposed to view" (*ibid.* 26). It was thought that surface ceramics were a result of the natural

destruction of each layer of the tell. Thus these ceramics were seen as a direct correlation or index of the site's history.

Glueck transplanted this model wholesale onto sites in Jordan. Most of these sites, however, were not formed as tells (*ibid.* 27–28). His main reason for using the model seems to be the similarity of some Jordanian ceramic sequences with those found in Palestine. This meant that he could order his samples on the basis of Palestinian sequences without excavating sites in Jordan. Nevertheless, Glueck's results were highly impressive and his outline of Jordanian settlement history was highly influential. Moreover, the use of surface artefacts as an index of a site's history became a dominant method in surface archaeological surveys.

Nevertheless, the assumption that surface artefacts represent the chronological sequence of the site has rarely been tested in a Near Eastern setting. Ammerman, in his wide-ranging discussion of the use of surface surveys, really only cites the work of Whallon as evidence that the surface collection correlates to the sequence of layers in a tell site (Ammerman 1981, 73). Whallon, in a large-scale survey of the Keban Reservoir area in central Turkey, tested his surface ceramic samples by correlating them with excavated samples (Whallon 1979, 292–300). He found that there was a rough degree of correlation, although the lower layers of the sites were not represented in the surface samples. This aspect was stressed by Rosen (1986) in her discussion of the geoarchaeology of tells, where she showed how earlier period ceramics were poorly represented in most types of tell site. However, citing work by Kirkby & Kirkby (1976), this could be offset by scraping the surface soil down to a depth of 5cm and collecting the ceramic material. This was to have a statistically significant effect on ceramic retrieval (Rosen 1986, 490–50). In her wider discussion of the surface sherd distribution of tells (*ibid.* 46–51), Rosen still places surface sherds as a record (admittedly only partial) of the history of the tell.

As with Glueck's observations, these more scientific approaches still assume surface sherds as an index of the site sequence. This is in contrast to work carried out, mainly in America, where sub-surface remains are seen as derived from surface depositions and events (Dunnel & Dancy 1983, 269). In other words, the surface we see today is in the process of being the next generation's buried layer. This represents a completely different way of looking at the surface record; one which sees the surface artefacts as indicators of spatial use. This has been highly successful in surveying archaeological sites in North America and mapping the large complexes in Central America (see Sullivan 1998). These studies have been influential in demonstrating the power of surface artefacts studies to inform on a wide range of issues beyond chronological divisions. Many of these studies have spent considerable time

determining the origin of surface artefacts, which Lewarch & O'Brien (1981, 298) stressed was the biggest hindrance to the potential of surface artefact studies.

The response to such concerns has been to sample sites intensively, using detailed gridding in conjunction with test pitting. These sophisticated sampling strategies were designed to ascertain the effects of ploughing, erosion or other forms of disturbance. They have been used to great effect in sites in the Mediterranean and sections of the Near East (*e.g.* Bintliff & Snodgrass 1988; Wilkinson 2000). Moreover, Randsborg has recently questioned the long-term value of these intensive-sampling surveys as he believes they suffer from an "anxiety of statistic and sciences" (Randsborg 1998, 250). He noted that in surveys conducted by Danes in Tunisia, the first perception of settlement patterns was not substantially different from the long-term conclusions based on several years' intensive survey and excavation (*ibid.* 252).

However, it is clear that such sophisticated sampling methods are best when dealing with a single period or shallowly stratified sites. The effectiveness of such methods on deeply stratified sites is unclear. While many archaeologists now use highly systematic sampling patterns to locate and define sites in the Near East, they do not readily sample the artefact spread on tells or similar sites in such a fashion (*cf.* Banning 1996). The paradox between the use of surface ceramics to show the chronological sequence of a site, or as a spatial index of site function, have not yet been successfully resolved in Near Eastern archaeology. While the use of surface ceramics as an index of site history is under-theorised, the use of surface artefacts as an expression of functional spatial patterns is unsuited to many sites in southern Jordan. In this study, the use of ceramics as a site history index was the prime methodological tool. However, given the history of the technique, as discussed above, certain assumptions about its use must be questioned.

A prime assumption in the sole use of ceramics to phase a site history is that all periods must leave a ceramic trace. The conclusion being that if there is no ceramic trace then there is no occupational trace. Given the widespread use of ceramics since prehistoric periods, that this will hold true for the Classical period is a fairly safe, commonsensical assumption. The limited testing carried out on Near Eastern sites, referred to above, seems to bear this out. However, just as many excavations fail to confirm the ceramic sequence outlined by surface ceramics. In southern Jordan, Bienkoswski & Adams (1999) wanted to test for the transition of later Bronze Age sites into early Iron Age sites. They based their initial exploration on sites of this date found by MacDonald in his Wadi Hasa Survey (MacDonald 1988). However, upon excavation of some of these sites, the expected ceramic periods did not

appear. Accordingly, Bienkowski and Adams questioned the value of survey data but did not critically evaluate their own small trial trenches. Similarly, at the site of North Shuna, the excavators found four large parallel walls which they dated to the Early Bronze Age (Baird and Philip 1992). They based this date on the fills between the walls which were entirely composed of Early Bronze Age ceramics. However, the walls were later discovered to be part of a large Hellenistic pillared building (Findlater forthcoming). This Hellenistic phase, as well as a later Roman/Byzantine layer, were noted in the original surveys. As both cases show, the excavated ceramics were somehow still considered to be more secure.

The notion that all periods must leave a ceramic trace also assumes that ceramic presence denotes primary use of the vessel. This is a question of the residual nature of ceramics and how they can be reused in later deposits as fill in wall fabric or earthen roofs or as part of manuring phases. This aspect has not been fully understood in survey projects in southern Jordan. Within the Mediterranean area these factors are more clearly established but the overall nature of residual ceramics is still unclear (Evans & Millett 1992). While it is usually assumed that reuse can occur within a site without affecting the surface ceramic sequence, this cannot be certain in every case. In the 1960s, the reuse of building material from ancient sites in the research area probably resulted in the transportation of ceramics from one site to another.

### DAS ceramic sampling

All the DAS monuments were surveyed by taking purposive samples along pedestrian transects. In the 1994/5 and 1996 seasons all potsherds were collected. From the 1998 season onwards, however, only diagnostic sherds were picked up. These diagnostic samples were ceramics that exhibited detailed chronological variation.

The environs of all upstanding sites were sampled, except for most of the enclosures and small rectangular structures. These are very common in this landscape and are generally the remains of former stock control systems. Samples from these sites usually consist of very small quantities of sherds, which do not justify the time required for full sampling. The interiors of all other structures were sampled, and material was collected from a 1m wide area around the structures. On larger sites a transect system using 3m wide corridors was adopted. No attempt was made to distinguish the corridors in the recording system, as the project's objectives required general information concerning the date of sites. When sampling, the team covered the ground with a slow but steady pace; a small portion of the transect/area, usually 2m in diameter, was chosen for a more intensive pick-up. Personnel

slowly traversed the whole site in a systematic fashion collecting artefacts by visual identification.

In the 1994/5 and 1996 seasons, as far as possible all artefact scatters were sampled. It must be noted that every part of the landscape contained a low-density scatter of pot-sherds, stone artefacts and other items. The identification of a site within this low-density background was based on the degree of concentration of artefacts combined with an assessment of local topography.

The collection of pottery based on field identification of diagnostic sherds does of course bias the sample. In one sense it positively biases the sample towards ceramics most suitable for dating. However, this also means that surveyors collect samples that correspond to existing artefact types, which means that unknown types may not be collected as fully. There is also a potential bias towards certain types of decorated sherds. This is because most Classical red wares and Islamic glazes are more easily detected on the ground than prehistoric wares. However, the training and research experience of the surveyor can off-set these biases. For this reason, DAS used highly experienced personnel with a good knowledge of the research period and material culture of southern Jordan.

## DAS ceramic analysis

This section will describe the post-field survey organisation and analysis of the ceramic samples. First, the initial pre-analysis sorting of the data will be described, with specific comments on the process. Next, a general discussion of the ceramic chronological sequences in the dating of southern Jordanian sites will follow, with specific reference to the lack of contextually secure sequences. Finally, a brief description of the ceramics by period and the identification frameworks used will be given.

### Pre-analysis sorting

Ceramic samples were taken from 229 sites. During the field seasons all sherd samples were counted and weighed. The table of sherd counts is appended as Appendix 2. This process was to sort the corpus by the presence of form and decorative markers into diagnostic and non-diagnostic groups. The diagnostic group was divided into five groups: rims, bases, handles, decorated bodies, and others. This diagnostic group was passed to the ceramicist for detailed processing. "Decorated bodies" not only included applied painted decorations but incised or pinched forms as well. "Others" refers to lids, lamps, pipes or tiles. The totals of these counts are summarised in Table 17 (page 413).

## Diagnostic processing

Following the ordering of the corpus into the two groups detailed above, the diagnostic sherds were examined for their approximate date and probable function. The results of this phase are presented in Appendix 3. Due to the continuing lack of published stratified sequences for southern Jordan, and to the lack of knowledge of local fabric types, only rims and decorated sherds were examined in detail. Handles and bases, which were also collected in numbers, do not, at this time, present sufficient sensitive chronological markers to allow precise identification. Of the diagnostic group of 10,956 sherds, from the first phase of processing, only 5,511 sherds could be given secure dates. Of these, 3,880 were rims while 1,460 were decorated body sherds. Other forms were: Lamps – 2; Handles – 44; Lids – 7; Bases – 113; Pipes – 5. This represents 26% of the total ceramic sample and 50% of the diagnostic group. These 5,511 sherd types with approximate dates were entered into an Access Database.

## Ceramic parallels

Although the pottery from most periods in northern Jordan is well known, nearly all that has been published from southern Jordan is in survey or preliminary reports (*e.g.* Parker 1987a; Miller 1991). Moreover, these publications mostly base their periodisation on stratified sites in northern Jordan, the most notable being Hesban (Sauer 1973). There is, however, considerable regional variation in the pottery of most periods in Jordan, with the published assemblages from the north of Jordan not being entirely applicable in the south (Bienkowski & Adams 1999; Walmsley 1998, Walmsley & Grey 2001) (Findlater 2002, 139). The periodisation of the published site assemblages from the Limes Arabicus Project (Parker 1987a), which provide one of the few sources of comparative excavated material for Nabataean through Byzantine pottery in southern Jordan, was broadly followed and amended by recent work in and around Petra (Stucky *et al* 1994; Bignasca *et al* 1996; 'Amr *et al* 1998,'Amr 1991). Characterisation of the Islamic ceramics followed Sauer (1976, 1982, 1986a), Franken & Kalsbeek (1975), Hendrix *et al* (1997), and Brown (1992). Amendments to the periodisation followed in previous studies was provided by recent work carried out at Islamic sites in southern Jordan (Johns *et al* 1989; Johns 1993; Vannini & Tonghini 1997; Walmsley 1995, 1998). The pottery from the Late Iron Age in southern Jordan is perhaps the best known of all the periods found in the DAS. This is due to the excavations at Tawilan, Buseirah, Ghrareh, and Umm El Biyara which date it to the seventh and sixth centuries BC. The publication of the ceramics from these sites by Hart (1995a; 1995b) and Oakeshott

(1978; 1983) were used as guidelines for classification of the Late Iron Age pottery. Therefore the following periodisation was used for the DAS ceramics:

| | Centuries |
|---|---|
| Late Iron Age: | 7–6 BC |
| Nabataean: | 2/1 BC–AD 1 |
| Nab/Early Roman: | AD 1–2 |
| Roman: | 2–4 |
| Early Roman: | 2–3 |
| Late Roman: | 4 |
| Late Roman/ Early Byz: | 4–5 |
| Byzantine: | 5–7 |
| Late Byz/Early Islamic: | 7–8 |
| Early Islamic: | 8–11 |
| Middle Islamic: | 12–15 |
| Late Islamic: | 16–19 |

One should note that in this project Early Roman is used to denote the period after AD 106 and not that of 63 BC–AD 135 as used by projects to the north. Most projects base their chronology on the Hesban sequence which follows a traditional historical dating of the inception of Roman power with the reorganisation of the Decapolis states by Ptolemy in 63 BC. Thus many projects in southern Jordan (such as Parker 1986a) class the ceramic record as Early Roman in Nabataean first century BC and first century AD contexts. As this archaeological terminology is inspired by historical phasing, the classification of Nabataean ceramics as Early Roman seems most unfair and not a little confusing.

The overall classification of the DAS diagnostic ceramics noted 27 periods for the 5,511 sherds. These are tabulated in Table 18 (page 414). These can be summarised into the following broader periods: Prehistoric 1%; Iron Age 8%; Nabataean 22%; Roman 35%; Byzantine 21%; Early Islamic 4%; Middle Islamic 6%; Late Islamic 3%. While the predominance of Classical period ceramics demonstrates greater occupation in these periods, the overall figures are biased by the differential understanding of the ceramics and their identification. The following sections will broadly describe the parallels for identification of each period's ceramics. Certain diagnostic types are illustrated in Figures 93 (page 415 with descriptions in Table 19, page 416) and Figure 94 (page 417 with descriptions in Table 20, page 418).

### Prehistoric period

Twenty sites (79 sherds) were identified as containing Chalcolithic and Early Bronze Age ceramics. Four sites (four sherds) contained Middle Bronze Age ceramics. This period will not be discussed further as it is not within the research framework of this study.

### Iron Age

Pottery from the Iron Age period was found at 46 sites (602 sherds). The Iron Age forms that were found fit in well with the ceramics from the seventh and sixth century BC sites at Tawilan, Buseirah, Ghrareh, and Umm El Biyara. The most common vessel forms found in the DAS were various bowl forms, cooking pots, and kraters. Most of the bowls are characterised by triangular section rims (see Figure 93, No. 5, page 415). This broadly defined type is common at Tawilan (Hart 1995a, 202). Less numerous were bowls of the fairly standard Late Iron Age fine ware from the southern Jordanian Plateau (Bennett 1966, 387, 10 & 16; Oakeshott 1983, 58, 6 & 10; Hart 1995a, 200, 210; 1995b, 250, 252; see Figure 93, No. 1 & 2) No painted decoration was found on either of these bowl forms, or on any other sherds. This is reminiscent of the findings by Lindner's surveys in the Petra region (Zeitler 1992, 172). The cooking pot rims were all characterised by a ridged rim (see Figure 93, No. 4). Comparisons for these can be found at Tawilan (Hart 1995a, 260–61), Buseirah Area D (Hart 1995b, 256, 10–13), and Umm El Biyara (Bennett 1966, 389, 12). Quite a number of the distinctive Late Iron Age holemouth jars were also found (see Figure 93, No. 3). Comparisons for this vessel type can be found at Tawilan (Hart 1995a, 224–229) and Umm El Biyara (Bennett 1966, 387, 7).

### Nabataean period

Nabataean period pottery was found at 136 sites (Sherd counts: Nabataean – 492; Nabataean/Early Roman – 1335; Classical – 3). The most common forms of Nabataean pottery found included small fine ware bowls. These bowls are characterised by rim forms ranging from carinated and inverted styles, to carinated elongated styles, to slender hemispherical styles (Stucky *et al* 1994, 282–3; Bignasca *et al* 1996, 175–187, 207–209; see Figure 93, Nos. 8–11). Painted decoration is common on the interiors of these open bowls. The two most common designs consist of bands of parallel and sloping lines interspersed with solid circles, and a less carefully executed design of large stylised floral motifs. Both of these designs were done in dark-red brown paint (see Figure 93, Nos. 8 & 9). Of particular importance in refining the dates for Nabataean fine wares are the results from the Swiss excavations at Petra. These results show designs and their associated rim forms that date

from the first century BC to the third century AD, although the majority date to the first and second centuries AD (Stucky *et al* 1994: 283; Bignasca *et al* 1996, 207–209). Unpainted bowls were common as well (Stucky *et al* 1994, 282; Bignasca *et al*, 1996, 175–187; see Figure 93, Nos. 10 &11). Rouletted and incised decoration was also attested on fine Nabataean wares (Khairy 1982; Bignasca *et al* 1996, 189). The Nabataean coarse wares were predominantly represented by necked, globular cooking vessels characterised by body ribbing. The rim profiles of these vessels show a peaked rim and sharp concave join between the neck and shoulder, as well as more elaborately profiled rims (Stucky *et al* 1994, 288–290; see Figure 93, No. 7).

### Roman period

Roman pottery was found on 170 sites (Sherd counts: Nab/Early Roman – 1335; Roman – 270; Early Roman – 68; Late Roman – 377; Late Roman/Byzantine – 729; Roman/Byzantine – 84; Classical 3). The most common forms from this period were grooved cooking pot rims (Parker 1987a, 534–5; see Figure 93, No. 12), straight-sided bowls with squared rims and exterior notches (Parker 1987a, 537; see Figure 93, No. 13) and various jar forms. Late Roman forms and surface treatments continue into the Early Byzantine period (Brown 1991, 223). The assignment of sherds to one of these two periods is therefore, in some cases, tenuous. Where differentiation was difficult, sherds were classified as Late Roman/Early Byzantine.

### Byzantine period

A total of 169 sites had Byzantine pottery collected from them (Sherd counts: Late Roman/Byzantine – 729; Roman/Byzantine – 84; Classical – 3; Byzantine – 475; Early Byzantine – 129; Late Byzantine – 49; Late Byzantine/Early Islamic – 141). The most common forms found included closed cooking pots (Parker 1986a, 215, Parker 1987a, 543; see Figure 94, page 417, No. 3); sherds of unribbed ware that were wavy incised (Parker 1987a, 587, 589; Hendrix *et al* 1997, 239; see Figure 94, No. 4); and various jar forms (see Figure 94, Nos. 1, 2, 4). A number of examples of fine red-slip wares were also found. These dated from the fourth century onwards (Hayes 1972, 323; 1997, 62). For some Byzantine forms, the differentiation between Early and Late Byzantine pottery is still problematic. This is due to some forms being common to both phases, and some not being sufficiently understood stratigraphically (Brown 1991, 224). This is especially the case for southern Jordan (Walmsley 1998, 439) and, as a result, some forms have been broadly classified as Byzantine.

## Islamic period

The Islamic period has traditionally been divided into the historically known periods of royal dynasties (Whitcomb 2001). However, as has become increasingly obvious, these are hard to match to the divisions within the material record. Accordingly, many scholars now choose to divide the period into Early, Middle and Late (Johns 1993). This is followed in the DAS periodisation. In this section, however, the ceramics will be treated as a whole.

Early Islamic pottery was found on 81 sites (Sherd counts: Late Byzantine/Early Islamic – 141; Early Islamic – 128; Early/Middle Islamic – 37; Islamic – 11). In contrast to northern Jordan, Late Byzantine pottery styles continue well into the Early Islamic period in the south of Jordan (Brown 1991, 224; Hendrix *et al* 1997: 251; Walmsley 1998, 439), and seventh to ninth century pottery is subsequently difficult to distinguish. A bias towards Late Byzantine pottery may thus exist in the DAS ceramic classification. However, Early Islamic smooth buff or pink wares are quite distinctive. A few examples of these wares were found in the DAS. They were white slipped, and painted in red, purple or brown paint, in loops, spirals and wavy lines (see for comparisons Sauer 1982, 330–32; Hendrix *et al* 1997, 251–52).

Middle Islamic ceramics were found on 70 sites (Sherd counts: Early/Middle Islamic – 37; Islamic – 11; Middle Islamic – 283; Middle/Late Islamic – 189), while 40 sites had Late Islamic pottery (Sherd Counts: Middle/Late Islamic – 189; Islamic – 11; Late Islamic – 7; Ottoman – 6). Hand-made geometrically painted ware (also called Ayyubid-Mamluk handmade painted ware) accounted for most of the Islamic pottery found. This pottery was painted in a dark colour – purple, brown or black – in designs that covered much of the surface of the vessel. Unpainted hand-made vessels of the same ware were also found. The shapes included a variety of bowls with squared rims, and jars with splayed, flattened rims (see for comparisons Franken and Kalsbeek 1975; Johns *et al* 1989; Johns 1993; Brown 1992; Pringle 1984; see Figure 94, Nos. 5–7). This hand made ware has not yet been precisely dated and its evolution over time remains difficult to assess. However, this pottery is found from the twelfth century, and remained in use and was produced well into the Ottoman period (Johns 1993; Vannini & Tonghini 1997, 380–381).

## Conclusion

The DAS project was designed to produce a record of the spatial relationship of state/military sites and settlements within a landscape setting of resource areas and communication routes. The choice of sample area allowed the analysis of the whole gamut of geographical areas within the wider study of Roman forts in southern Jordan. This was the

first time that this area had been recorded from the Wadi Arabah to the desert edge and, as such, it provided an excellent dataset for testing the questions of this study. Within the landscape model developed in Chapter 2, the survey method followed a prospection model that focussed on spatial structure, such as ancient roads, and the relationship with material correlates of imperial Roman power. The DAS project employed a rigorous and explicit method for the delineation of the landscape use of routes and the connection with state/military sites. While remaining aware of the potential biases inherent in the use of surface ceramic samples, the project was able to provide a clear and workable diachronic framework for most of the surveyed sites.

# Chapter 6

## Reinterpreting military sites in the landscape

### Introduction

This chapter demonstrates that military location over time was highly conservative and only varied on the desert fringe of the Jordanian Plateau. This is achieved using primary evidence from the DAS. The DAS data is presented within a framework of communication routes and resource areas. It questions earlier interpretations of routes and proposes new lines of communication. By using a strict method to attribute military function, clear spatial and temporal patterns are evident. When correlated with routes, these patterns demonstrate that an overtly military interpretation of the fort system is incorrect. This is further proven by the discovery of an Iron Age boundary system that uses the only clear defensive position in the landscape, separating desert from sown.

### Research background

Parker (1986a) stressed that the location of military sites in southern Jordan exhibited a defensive strategy through his idea of a border zone. Fiema (1995), however, pointed out that many military sites lay on road systems far behind the border zone, making them more open to socio-economic factors than Parker allowed. The road system has rightly been emphasised by Isaac as underpinning the system of forts that linked the frontier area. To determine a system of forts without demonstrating the road system is, as Isaac called it, an "unstructured procedure" (Isaac 1992, 128).

The main conclusion drawn from Chapters 3 and 4 is that it all of the major military sites dating to the Classical period, lay on routes or, more precisely, on the nodal points of routes. However, as the archaeological evidence of Chapter 4 made clear, there is also substantial evidence of a concentrated movement of military sites to the edge of the desert areas. The spatial patterning of sites along this desert edge is the main basis for Parker's contention that this is a clear demonstration of stress on the system by nomadic peoples (Parker 1997a). The discovery of a series of milestones by Brünnow & von Domaszewski (1905) lay at the heart of Parker's claim that these desert forts were linked by a road. Now enshrined in Thomsen's (1917) map of milestones, this road was seen as part of a larger road system that linked forts such as Dajaniyah and Udhruh with the *via nova Traiana*. Killick (1986) added more proof of this by noting a road leading from Udhruh towards Dajaniyah. However, Whittaker (1994, 93–94), while accepting the existence of the road, questions the military value of it and

proposes it is an environmentally determined road system. Graf (1997a, 1997b) questioned completely the notion of a vast desert road linking these forts and claims it is a small trunk road. This has become accepted by many scholars (*e.g.* Kennedy 2000, 142).

The basic problem with this debate is that the evidence rests on fieldwork carried out more than 100 years ago. As was noted in Chapter 2, Parker did not sufficiently investigate the road system neither in his 1986 overview of military sites in Jordan nor in his more detailed Limes Arabicus Survey on the eastern edge of the Kerak Plateau (see Chapter 2). Graf, while carrying out a detailed survey of the *via nova Traiana* to the south of Petra (Graf 1995), has never determined the physical existence of this road. Similarly, Fiema's assessment of the road systems rests on secondary evidence stemming from the work of Brünnow & von Domaszewski (1905), Alt (1935), Glueck (1934, 135, 1939) and Stein (Gregory & Kennedy 1985). The use of milestones to define and provide a history of road use has been widely used ever since the first archaeologists began work in Jordan (as indeed the whole Empire). Milestones are very distinct objects that provide much information ranging from distances to dates, to names of governors and emperors. Most surveyors, such as Brünnow & von Domaszewski (1904, 1905) and Glueck (1934, 1935, 1939), were content to record in-situ and displaced milestones but did not systematically record the route or the nature of the actual road. Moreover, they failed to sample fully all of the structures along the route.

Graf's (1995) recent work has followed in this tradition by only (or more fully) recording milestones. This is because historical data can be gleaned directly from such monuments and does not have to be processed in the same way that archaeological data does before it can be presented to the academic world. However, it has meant that histories of road systems are tied directly into historical events stemming from milestone inscriptions. Thus the use and lifespan of the road was determined from historical information gleaned from milestones. Evidence for the date of the inception of the Arabian province, Septimus Severus' strengthening of the Arabian frontier (AD 193–211) and for the collapse of road networks, especially the *via nova Traiana* in the later third century following the Palmyrene Revolt, comes mainly from milestone inscriptions. While some events, such as the inception of the province, are fairly easy to correlate with historical data, Isaac's (1992, 304–309) detailed discussion on the Roman use of milestones should be kept in mind. He showed very succinctly how milestones, although primarily erected to measure distance travelled, had a value as monumental propaganda of imperial rule and power. Thus, they are not a neutral index of road use or periods of activity.

Given that major roads have only ever been surveyed in such a fashion, it is not surprising that there is a dearth of information on smaller roads and the frequent tracks between the Wadi Arabah and the Plateau. Villeneuve's review of evidence for routes in the Jibal lacked detail and was solely based on MacDonald's Wadi Hasa Survey (1988) (Villeneuve 1992, 283 & Fig. 5). This reflects the lack of work done by earlier surveyors (*e.g.* Frank 1934, Glueck 1934, 1935) in mapping these routes. Recently, only Lindner (1992, Lindner *et al* 2000) has studied the routes between Petra and Wadi Arabah in detail. On the Plateau, smaller routes are rarely noted, as most survey projects are site focussed (*e.g.* Amr *et al* 1998). Thus, Fiema's recent overview of the communication system of the Petra hinterland was, in his own words, "sketchy" (Fiema 2002b, 42–44).

However, on the basis of this slender dataset, quite extensive hypotheses have been developed. Fiema (*ibid.*), drawing on his PhD work (1991) and correlating this with observed changes in military variation (Fiema 1995), has noted that Petra became increasingly isolated in wider economic frameworks. At the same time there was a rise in economic activity in the Ma'an area based on the flourishing of trade networks with the Hejaz (*cf.* Crone 1987, 149–164). Like Graf's and Parker's historical reconstructions of the military frontier, Fiema's arguments, while stimulating, rest on an inadequate body of evidence.

This means that the core question of the relationship of military sites with major routes has not been interrogated sufficiently. Further, there has not been a systematic investigation of major cross routes to ascertain if there was military or state monitoring/control of these routes. In the specific instance of the Desert route, it is critical to know if the line of desert forts is directly associated with a major road system or, as Graf argues, is only a trunk road for access. Similarly, while the route of the *via nova Traiana* is well known, the investigation of structures along this route has been erratic. This has led some scholars to doubt the presence of garrisons along its route (*e.g.* Lander 1986) or that it was part of a *limes* system (Eadie 1985).

## A reinterpretation of military sites

Within the model of resource control outlined in Chapter 2, this chapter will test the main conclusion of Chapters 3 & 4, that military location was highly conservative and only expanded on the desert fringe. It will attempt to answer the questions outlined above. Most of the chapter will describe these military sites and place them within their landscape framework of communication routes. The method of inquiry will be through descriptive

analysis correlated with ceramic dates from surface sample. These ceramic observations will be compared with the conclusions of previous survey projects.

The framework for this study is the system of routes throughout the DAS project universe. A route is defined on the basis of three correlated and combined sources of evidence. First are the observations made by the survey teams about the topographic nature of corridors in the area; second is information from local Bedouin in the area about how they traditionally moved about in the terrain; and the third source is from the review of the archaeological and textual evidence of Chapters 3 and 4, which refers mainly to the major routes (*e.g. via nova Traiana*) outlined above.

Within this framework of routes, the DAS project prioritised the focus of the field survey on the location of state sites, such as forts, towers and *caravanserai* within the definition of the DAS project (see Chapter 5). However, the presence of towers does not demonstrate fully a military or state presence, as they are a ubiquitous part of the Classical landscape (see Dar 1986). While they can be viewed as having a policing role within the imperial system (Hopwood 1986), the variety of functions within an agricultural landscape (Banning 1992; Dar 1986) makes secure interpretations difficult. Within the logistical confines of the project, state sites were correlated with data from other sites lying within the sampled corridor of the route, the aim being to provide a wider dataset of route usage to compare with the evidence from the state sites.

As the evidence from Chapter 4 makes clear, and this has been strongly emphasised by Isaac (1992, 188–198), Roman military sites were not located on strong defensible positions. The only exception to the site-based evidence presented in this chapter is the analysis of a large landscape feature that may mark an ancient boundary or defensive line. Known locally as the Khatt Shabib, this feature is a long low wall associated with a line of towers that runs along the eastern edge of the Plateau, always occupying a higher ground advantage. Parker (1986a, 89), on the basis of parallels with similar walls in Roman North Africa (*cf.* Rushworth 1996, 305–307), postulated a Roman period function for the Khatt Shabib as a boundary marker or defence line. This feature has been poorly studied and its relationship to Roman forts not yet demonstrated. If there was such a relationship, it would strengthen Parker's view of the fort system as a linear defensive line.

The discussion in this chapter is broken down into six main parts. The first five sections will describe and analyse the routes of the DAS project universe. These sections are based on the main divisions in the DAS project universe. The routes are discussed in geographical order from west to east (Figure 2, page 316). The first section will discuss the main route in the

Wadi Arabah. The second section deals with the cross-routes from the Wadi Arabah to the Jordanian Plateau. These routes are traditionally the ones that would have continued across to Palestine before 1948. They are the Wadi Dahal route and the Faynan to Dana route with a subsidiary route leading up the Wadi Hammam/Wadi Ghuwair to the *via nova Traiana*. The third section will describe the main Plateau route during the Classical period, the *via nova Traiana*, and also a smaller route from Udhruh to Nijil. In the DAS project area, the main modern and ancient route of the King's Highway, which links all the towns of the Plateau-edge, correlates mostly with the line of the *via nova Traiana*. Therefore it will not be discussed separately. The fourth section outlines the evidence for the existence of a major desert route. The fifth section describes the cross routes between the *via nova Traiana* and the desert routes. Finally, the sixth section will describe and analyse the Khatt Shabib.

### Wadi Arabah route

The total length of this route and previous fieldwork has been fully described in Chapter 4. This section will concentrate on the area covered by DAS (See Figure 140, page 480 based on Map I Figure 84, page 404; Map IV Figure 87, page 407 & Map VII Figure 90, page 410). The DAS survey of this old road area from Qsar Tlah to Bir Madkhur aimed at looking for traces of an ancient road and any attendant sites, and to check whether sites were intervisible. MacDonald noted the remains of an old road through the Wadi Arabah that stuck to the foothills of the Plateau, which follows the eastern side of the Wadi Arabah (Figure 120, page 453). However, this track was used until the modern road was put in place and is marked on the 1960s 1:50,000 maps.

Chapter 4's results clearly show that the Wadi Arabah was an important communication route throughout the entire Classical period. In addition, the analysis of the texts in Chapter 3 demonstrates the longevity of military site occupation in this area. The DAS field survey did not discover any new sites of military significance. It did, however, note the degree of intervisibility between sites to test if the area was being extensively monitored. The sites under discussion can be found in Table 21 (page 419). In the table, the ceramic readings with an asterix next to the site number come from MacDonald's SGNAS project (1992).

The DAS survey noted a site to the north of Qasr Tlah, DAS 188, which had been previously noted as a tower/tomb by MacDonald (1992, 265 Site 149). This was a small square site, 6 x 6m, which sat on the edge of a ridge overlooking the Wadi Khanzeir to the south and beyond. In fact, MacDonald specifically notes that one can see Rujm Khanzeir (Khuneizir) (SGNAS Site 108) from here. However, SGNAS 108 had ceramics predominately from the Iron Age (*ibid.* 260). DAS 188 had ceramics from the Nabataean and Roman periods with

later Islamic material. It clearly was used for inhumations but was badly robbed and it is unclear whether it was originally a tower that was reused as a tomb or a tomb only. It was the only site to the north of Qasr Tlah that had a good observation point to the north and the south.

DAS 188 did not have a full view of DAS 192, Qasr Tlah. The archaeological remains of Qasr Tlah have been described in Chapter 4 and only the degree of intervisibility will be discussed. In fact, this major Roman fort does not have a good all round view and is slightly hemmed in on all sides, except the west, by the surrounding mountains of the Plateau. It is not intervisible with DAS 188. However, it does have a clear view north to a large hill, which had the remains of an old Mandate fort. This site, DAS 191, was located at the entrance to the Wadi Dahal and is in effect a small island in the middle of the alluvial base of the wadi. As noted in Chapter 3, the Wadi Dahal was an important route down from the Plateau and was in use until 1948. The police fort controlled this traffic. However, with the construction of the modern asphalt road to the west, the fort (now a police post) moved to the road edge. The older site seems to have been deliberately demolished. No archaeological remains were noted or ancient ceramics retrieved. It should be noted that this site has a clear view to the tower site, DAS 188, to the north.

Seven kilometres south of DAS 191 is the site of Khirbat Hassiya, DAS 189. First noted by Frank (1934, 215), the site was properly sherded by MacDonald (Site 229, MacDonald 1992, 90 fig.18), who established a date range in the Nabataean period. The DAS survey added some Roman material to this sample. MacDonald thought that it was a way station or *caravanserai* between Wadi Faynan and Qasr Tlah. Certainly, as discussed in Chapter 4, the site is not a military one, but MacDonald failed to mention the tower that lies on a slight ridge to the east of the site. The tower had been noted by Frank and included in his plan of the site (Frank 1934, plan 14) (Figure 76, page 395). As far as DAS could ascertain, this tower acted as a look-out solely for the main site and was not intervisible with sites to the north or south.

The next set of sites south of Khirbat Hassiya are all located around the edges of the Wadi Faynan, where the large site of Khirbat Faynan is located. The old track, as noted by MacDonald, would have skirted the western edge of the Jabal Hamrat Ifdan (Map IV Figure 87, page 407) which travelled partly through the Wadi Fidan (where the spring of Ain Fidan is placed) and then south past DAS 190 (Abu Dhibana) and DAS 181 towards Bir Madkhur. The Wadi Faynan sites are discussed in the section for the route from Wadi Faynan to Dana (see below).

South of the Wadi Faynan area only one new site was discovered 14km south of DAS 190 Abu Dhibana. DAS 345 is a small site consisting of two semi-circular limestone structures, about 6m in diameter, with an area of small terraces to the west. It had a ceramic occupation of the Nabataean and Early Islamic periods only. Between this site and Bir Madkhur, the next major Roman fort 10km to the south, DAS did not find any sites or indication of ancient routes. However, only one transect in this area was sampled and sites could easily have been missed. Bir Madkhur was not surveyed by the project and it was discussed in Chapter 4.

### Discussion

While it is clear that the Wadi Arabah route had a diverse infrastructure of forts and *caravanserais*/roads stations, it would seem that these sites were not designed to be intervisible. The dating of the DAS examples demonstrates the main Classical period use of this route, although the sample size is small. However, there was no indication of a cleared route or the presence of milestones. However, as was made clear in Chapter 3, the *Tabula Peutingeriana* map shows that the main route from Aqaba northwards went to Bir Madkhur and then west towards Abda. There is evidence of milestones on this route in both Israel (Avner 1996; Meshel & Tsafrir 1974, 1975) and Jordan (Smith *et al* 1997, 59–60). It may be that the routes to the north were only important as cross-routes from Jordan to Palestine.

## Cross-routes from the Wadi Arabah to the Jordanian Plateau and Israel

Within the DAS project area, there are several main tracks up from the Wadi Arabah to the Jordanian Plateau (Figure 2, page 316). Most of these routes would have led westwards across the Arabah to Palestine. While Frank (1934) and Glueck (1935) observed the main Wadi Arabah route, they did not systemically survey the side wadis to the Plateau. Moreover, MacDonald (1992) although wishing to link his SGNAS and WHS projects, hardly noted the existence of these important linking routes (and attendant sites). Only Lindner, in his investigation of the lower Plateau area, has systemically surveyed the routes that lead to the wider Petra area (Lindner 1992, Lindner *et al* 2000).

Just to the north-west of the DAS area is a main track that led from Qasr Fayfa up the Wadi Khanzeir to Buseirah on the Plateau. This track was discussed in Chapter 3 as a possible main route from Palestine, down from Mamshit (Kurnub) through the Ascent of the Scorpions (Harel 1959) and on to Ain El Arus (En Tamar) before moving across the Wadi Arabah to Fayfa. In the *Tabula Peutingeriana* this route leads north from Fayfa to As Safi and up the Wadi Isal to join the *via nova Traiana* on the Plateau (see Chapter 3). However, as Aharoni (1963) noted, there were far more direct routes to the *via nova Traiana*. One of

these is the route up the Wadi Khanzeir to near Buseirah, but a better, less steep route is up the Wadi Dahal to the south (see Figure 2, page 316). This route was surveyed by DAS and is discussed below.

Another main route heads from the Wadi Faynan area through the Wadi Dana to Dana (Figure 2, page 316), although some lesser routes divert slightly to the south and climb up the Wadi Ghuweir to the Shaubak area. Both of these routes were investigated by the DAS. In the Wadi Arabah, south of Faynan, there is another route up to the Plateau. This travels up the Wadi Namala and emerges at Beidha, just 5km north of Petra. In the Arabah, at the entrance to the Wadi Namala, lies the site of Qasr Namala (DAS 344). First noted by Frank (1934, 228 Plan 22A), the site seems to be a way station on the route up to Petra. He noted Roman ceramics but the DAS did not note any diagnostic ceramics (see Chapter 3). This route will not be discussed here as most of it lay outside the DAS project area.

### Qasr Tlah–Wadi Dahal–Gharandal route to *via nova Traiana* /King's Highway

The Wadi Dahal route would have taken travellers down from the Plateau to Qasr Tlah and hence westwards across the Wadi Arabah to Ain Hosb, which is now Hazeva in Israel (See Figure 141, page 481 based on Map I Figure 84, page 404; Map II Figure 85, page 405 & Map IV Figure 88, page 408). Bedouin in the area relate that it was a busy route for traders travelling from the Hejaz to Palestine until 1948 when the border was closed. A major discovery in the Wadi Dahal was a large building with many rooms located high up on the east side of the wadi overlooking a bend, which is almost a halfway point between the Wadi Arabah and the Plateau. Lacking any agricultural base, it was previously interpreted as a road station. A small tower, situated to the east above the road station and overlooking a major section of the Wadi Dahal, is visible from a large tower, Al Museykneh, to the east. Both towers monitor the upper Wadi Dahal route. The dates for this route are presented in Table 22 (page 419).

The importance of the Wadi Dahal route is obvious from the frequency and nature of sites along its 15km course. At the western end of this route as it emerges into the Wadi Arabah lies the site of Qasr Tlah, a military site with a large reservoir and field systems, which was more fully discussed in Chapter 4. It is not directly placed at the entrance of the Wadi Dahal but lies to the north at the entrance to the Wadi Tlah, where a spring is located which feeds the reservoir. There is no modern permanent water supply at the entrance to the Wadi Dahal, although there is water two kilometres further up the wadi. At this spot, on both sides of a wadi spring, a large area of pre-Islamic graffiti on sandstone outcrops was located (DAS 158). While this material is hard to date, it certainly testifies to the frequency of traffic along

its route. The only structure located at the entrance to the Wadi Dahal was the remains of a Mandate and Hashemite fort (DAS 191). This fort is now demolished and its modern equivalent is now situated on the Wadi Arabah road. The fort was placed on a sizeable "island" in the middle of the Wadi Dahal from where it could monitor traffic coming down the wadi and into the Wadi Arabah. No archaeological remains were noted and no ceramics recovered. However, given that most Mandate forts were built near ancient forts, one may speculate that a similar situation existed at DAS 191 and the modern fort has obliterated any remains.

The track of the Wadi Dahal follows the wadi bed from DAS 191 past the area of graffiti and the spring (DAS 158) and on for a further two kilometres. However, at this point, high up on a cliff overlooking the wadi, a new site (DAS 129) was located. The site stood about 30m above the present wadi bed but was close to the Dahal track where the road begins to climb up from the wadi bed onto the west side of the wadi. The site is a large (*c.* 25 x 40m) multi-roomed rectangular structure that seems to consist of a series of rooms at its northern edge, from which a large enclosure wall leads off for 37m towards the south. The walls are built of partially dressed blocks and are about 1m wide. The ceramic sample was sparse and only produced prehistoric and Late Islamic sherds. The former can not be connected with this building. The lack of Classical sherds is surprising on a site with such a plan. The plan is similar to a site noted by Lindner (1992), in the Wadi Khusheiba, which was located on a route up to Petra. Lindner argued that the site served as a kind of road station for the traffic from the Arabah travelling to Petra and DAS 129 may have had a similar function.

The next series of sites associated with the Wadi Dahal route occurs when the track finally leaves the route of the wadi and begins its course along the easily traversed southern edges of the Plateau mountains. The first of these sites is DAS 153, a tower site situated on a high ridge overlooking the middle stretches of the Wadi Dahal. The site is 8 x 7.5m, has walls over 1m thick, and a small enclosure abuts the eastern side of the structure. The ceramics produced a date range from Nabataean to Late Islamic. It has excellent all-round views and is intervisible with another tower site to the east – Al Museykneh (DAS 155). Al Museykneh is situated further to the east of the track overlooking the upper reaches of the Dahal. It is perched on a lower ledge of Jabal Kolah with excellent views to the west. It is not spatially associated with the track but its position was clearly designed to monitor movement from this area. It is 10 x 10m square with some internal divisions visible. A rectangular enclosure wall extends from the east and south sides of the structure. A cistern is located 20m south of

the building and has been capped with a modern lid. The ceramics showed it had an occupation in the Iron Age and then from the Early Roman to Late Byzantine period.

There are no sites on the upper part of the Dahal track before it reaches the Plateau apart from DAS 180, Khirbat Al Qasr. The track passes immediately to the north of the site and the site was first noted by Glueck (1935, 98). He noted Islamic pottery but DAS noted little of diagnostic value. The site is 15 x 7m and the walls still stand six or seven courses in height (1.50m). There are several Islamic graves to the south of the site around what may be a cistern, but this part of the site has been robbed. The track now leads up to the Plateau top and joins the modern asphalt roads that follow the edge of Jabal Sarab. There is also a substantial spring, Ain Lahdha, in this area.

On the northern side of this area are three main sites that may have been more closely linked with the Wadi Dahal traffic. These are Khirbat Nusraniyah (DAS 5 Figure 95, page 420), Khirbat Kheiran and Khirbat Rashadiyah. They are all substantial settlement sites and, as can be seen from Table 22 (page 419), were occupied from the Nabataean period to the Early and Middle Islamic periods. The scale of these sites testifies to the densely occupation of the classical period in the Plateau.

However, the main centre of settlement in this area is located around the Gharandal area, which is 5km to the north-west of these sites (Map V Figure 88, page 408). During the Classical period, the main centre was known as *Arindela* (See Chapter 3) which is now the town of Gharandal where substantial Classical remains have been surveyed by Walmsley (Walmsley 1998. Walmsley *et al* 1999). From *Arindela* there was a side track which led to the *via nova Traiana.* As was noted in Chapter 3, while no obvious military remains have been found on the site, there are clear textual references to a garrison in the Byzantine period.

## Discussion

The overriding use of the sites along the Wadi Dahal seems to be in the Classical period. The lack of ceramic data from key sites such as DAS 129 hinders this conclusion. However, it is clear that the upper Dahal sites have an Islamic component. The presence of towers along the route suggests some form of monitoring but the lack of ceramic data from DAS 154 again precludes a definite statement. Nevertheless, the location of two attested garrisons at Qasr Tlah and at Gharandal, at either end of the route, points to the tight control of movement.

The route leading from Wadi Faynan up the Wadi Dana, which emerges on the Plateau at the modern town of Al Qadisiyah, is a major route in the area. However, one should note that, although a direct route is marked on many (mainly Israeli) maps (*e.g.* Figure 59, page 380) leading to the oasis of Ain Hosb on the modern Israeli side, this was not a route used by many. The more common route used when crossing the Wadi Arabah from Ain Hosb was directly westwards towards Qasr Tlah and then up through the Wadi Dahal. The route from Wadi Faynan through the Wadi Dana was clearly secondary to this. However, ringing the entrances into the Faynan area is a series of tower sites. They are mostly located at the northern and southern edge of a large ridge called Jabal Hamrat Ifdan, which acts as a shield for the Wadis Fidan and Faynan from the west (Map IV Figure 87, page 407). These are sites DAS 181, Barqa Hetiyeh; DAS 190, Abu Dhibana; DAS 187, Tell El Mirad; DAS 182, Rujm Hamr Ifdan; and DAS 186, Rujm Fidan. The dates for this section are presented in Table 23 (page 421).

DAS 181 is a small 6 x 6m structure, enclosed by a wall, 11 x 8m, that overlooks the main Iron Age site of Barqa Hetiyeh (Zwickel 1990, 43). The main site is a large copper processing area. The tower is placed on a limestone ridge to the south-east of the main site and possesses excellent views in all directions. As the tower only had a ceramic range from the Early to Late Byzantine (Table 23, page 421), it seems not to be connected with the main site but perhaps functioned as a wider observation point.

DAS 190, Abu Dhibana (Figure 96, page 421), had already been surveyed by Frank (1934, 221 & Plan 18B) and King (King *et al* 1987, 205, 211–212). They had established that it was a sizeable tower site dating from the Nabataean to Late Byzantine period. This was confirmed by DAS (see Table 23, page 421) which noted a large rectilinear structure (*c.* 20 x 30m) set on large knoll at the southern edge of the ridge of Jabal Hamrat Fidan. The site is immediately (south) adjacent to the modern road from the Arabah Highway to Faynan. The site possesses excellent views to the south, east and west but is blocked to the north by Jabal Hamrat Fidan. DAS 187, 181 & 186 are intervisible but it is not clear if any sites can be viewed from the south.

DAS 187, Tell el Mirad, is a series of 11 structures that lie on separate outcrops of a knoll called Jibal Mirad. It is situated halfway between DAS 190 and Khirbat Faynan (DAS 63) and overlooks all of the Faynan field systems to the north. It also has excellent views to the south. The main structure lies at the highest part of the knoll and is a well-built rectangular building (*c.* 12 x 12m) with internal divisions (Figure 97, A , page 422). The site had been

investigated by Hauptmann (Hauptmann & Weisgerber 1987), but King took a ceramic sample (King *et al* 1989, 211) which revealed a range between Early Bronze to Early Islamic. The DAS sample showed a range from Nabatatean to Early Islamic (Table 23, page 421).

The next set of sites is situated at the northern end of the Jabal Hamrat Ifdan: DAS 182, Rujm Hamr Ifdan, and DAS 186, Rujm Fidan. There was another site (DAS 185), surveyed by Glueck (1935, 20) and termed a military structure called Khirbat Hamr Ifdan (for which he mistook the name for another larger Bronze Age site but see Adams 1992 for explanation). DAS 185 could in no way be termed a military structure and is not included in this study.

Rujm Hamr Ifdan (DAS 182) was noted by Glueck to be 6 x 6m (1935, 20) and Raikes' map clearly places it in an area of field systems (see above). King's ceramic sample (King *et al* 1989, 211) has a range from prehistoric to Middle Islamic. It was clearly situated to overlook the western entrance to the Wadi Fidan. However, Rujm Fidan (DAS 186) seems to have monitored the spring (Ain Fidan) in the wadi. It is a small tower site (*c.* 6.5x 3.5?m) enclosed by a curving wall 0.80m wide (see Figure 98, page 423). Frank noted Roman ceramics (Frank 1934, 220), which was confirmed by the DAS sample's Nabataean to Early Islamic range (Table 23, page 421).

Past the ring of sites around the approaches to the Wadi Faynan, the next military structure may occur on the main site in the area, Khirbat Faynan (DAS 63). Khirbat Faynan (see Map IV Figure 87, page 407) stands at the confluence of the Wadis Faynan, Dana and Ghuweir. From the first discovery of the site, and its identification with the ancient site of *Phaeno,* scholars have been aware of the importance of the area. A major settlement, it serviced the copper industry which was the economic base throughout all intensive periods of human occupation in the Wadi Faynan area (Hauptmann & Weisgerber 1992). During the early fourth century, *Phaeno* was a place of exile for Christians from Roman persecution. Many came from Gaza and Egypt (*Hist. Eccl.* 8.13.5). In fact, so many Christians were present in *Phaeno* at that time that a convict, Silvanus from Gaza, served as Bishop there until he was executed by the authorities. Bishops were recorded at *Phaeno* from AD 431 to 587. A Theodore is mentioned as Bishop on a building inscription from Khirbat Faynan (Alt 1935, 64–65; Sartre 1993, 145–6, No. 109). Thus, the site's early associations with Christianity account for the number and scale of the churches in the immediate area (Frank 1934, 221–224).

The main part of the site sits atop a large hill, which is at the end of broad ridge between the Wadi Dana and Wadi Ghuweir. Several reservoirs are situated across the Wadi Faynan to the south and are fed by an aqueduct from a spring up the Wadi Ghuweir. To the west of the main site, and stretching over five kilometres, is a series of field systems (Barker *et al* 1997, 1998, 1999, 2000). Large dumps of copper slag ring the main area. Several large Christian cemeteries have been surveyed and excavated in the area (Findlater *et al* 1998). Although Khirbat Faynan has been widely documented since Lagrange first visited the area in 1898 (Lagrange 1898), it was only in 1995 that a proper plan of the site was produced as part of the Wadi Faynan Project (see McQuitty 1998 for research strategy). In 1997 this was published by Ruben who described the environs of the site more fully (Ruben *et al* 1997, 436–440). Freeman and McEwan (1998) surveyed a possible "suburb" of the main site to the south of the main reservoir. As noted in Chapter 4, a sizeable square structure was noted on the top of the tell (Ruben *et al* 1997, 439, Fig. 3) (see Figure 75, page 394). The building is about 30 x 30m square with rooms on all internal sides and an entrance (2.7m wide) in the south-west corner. Its central position may suggest a military or state structure but there is little to confirm this. The only ceramic sample taken from this part of the site was by King (King *et al* 1989, 209 4A) who noted ceramics from the Early Bronze Age to the Early Islamic period.

From Khirbat Faynan a track travels directly up the Wadi Dana, although one should note that there is a second track from here. This secondary route, which begins at the foot of the Wadi Ghuweir, ascends up through the Wadi Hammam, which leads on to the lower Beda area. This area contains two large settlement sites (DAS 292 & 293). From here it is a short walk to the Plateau edge where Khirbat As Samra, a major Roman fort (DAS 160), is situated on the *via nova Traiana*. Although no sites were noted along this climb, the route is easily monitored from all edges of the Plateau. It is, in the opinion of all local people, an easier route than through the Wadi Dana (see Map V Figure 88, page 408).

There are no major sites throughout the 10km route up the Wadi Dana until one reaches the village of Dana (DAS 7), which nestles on a wide ledge below the main Plateau edge. No Classical remains have been noted in the village, although lintels inscribed with crosses and the odd sherd of Classical date were noted in the environs of the village. The upper part of the Dana route is similar to the lower area in that a series of tower sites rings the upper reaches of the wadi. These are DAS 2, Khirbat Alimeh; DAS 6, Khirbat Sarab; and DAS 4, Khirbat Maqtah (also including settlement DAS 54); and DAS 60, Khirbat Er Rummana (See Map V Figure 88, page 408).

The westernmost of these, DAS 4, Khirbat Maqtah, is located on a long spur of Jabal Rummana and has excellent views north and over the western lower foothills above the Faynan area. The site was previously noted by Glueck (1935, 98). It consists of a tower site (DAS 4) surrounded by a settlement (DAS 54). The tower is over 12 x 12m square, built of large hewn blocks and has several internal divisions (see Figure 99, page 424). The ceramics from the site range from the Iron Age to the Late Islamic with a gap in the Early Islamic period (Table 23, page 421).

Several kilometres to the west of Khirbat Maqtah is the site of Khirbat Er Rummana, which lies on top of Jabal Rummana. It is 14 x 14m square and built of well-finished blocks but is badly damaged (Figure 100, page 425). The site has excellent views in all directions. The date range obtained by DAS ran from the Nabataean to the Late Byzantine period. The site is intervisible between DAS 4, Khirbat Maqtah, and another large site to the east DAS 6, Khirbat Sarab.

Khirbat Sarab, DAS 6, is a large site (150 x 200m) situated on the south-west edge of Jabal Sarab (Figure 101, page 426). Glueck (1935, 98) had noted the site but had failed to appreciate its size. Clearly composed of various large building, it is centred on a massive square building (17 x 17m). With walls over 1m thick it still survives to over 2.5m high. The ceramic sample showed a date range from the Iron Age to the Late Islamic period.

The last site in this section is Khirbat Alimeh, DAS 2, which is intervisible with Khirbat Sarab and Khirbat Er Rummana. It is situated above the village of Dana, several kilometres south-east of Khirbat Sarab, and possesses an excellent view down the length of the Wadi Dana. Unfortunately, at the time of this fieldwork, the site was used by the Jordanian military as an observation post and access was denied. However, Glueck surveyed the site (Glueck 1934, 77) and noted quantities of Nabataean ceramics.

### Discussion

The Faynan–Dana sites again show patterns of predominately Classical use in the Arabah and on the Plateau. Tower sites of predominately Classical use ring both the Faynan and the Dana areas. However, some of the Dana examples are hard to define since it is clear that areas of settlement, such as at Khirbat Maqtah (DAS 4 & 54) and Khirbat Sarab have grown up or are contemporary with the tower features. Nevertheless, it seems that an infrastructure of sites was in place for the whole Classical period from which this route was monitored. While there is clear Islamic occupation on some of the sites along this route, especially on

the Plateau edge, the pattern is not regular enough to suggest that a similar monitoring infrastructure was in place as in the Classical period.

### *via nova Traiana*

The *via nova Traiana* runs directly north–south along the spine of the Plateau in the Jibal and Shaubak areas (See Figure 142, page 482 based on Map V Figure 88, page 408 & Map VIII Figure 91, page 411). However, the stretch of the *via nova Traiana* in the project area had not been surveyed before, except to document the milestones (Thomsen 1917, Nos. 156–167). Fiema (1993) surveyed a section, following the Wadi Hasa Survey (MacDonald 1988), immediately to the north terminating at the Gharandal to Jurf Ed Darwish road. Graf (1995) had surveyed the entire stretch south from Petra to Aqaba. The DAS survey documented the length of the road from Fiema's survey to an area just north of modern Hai where Graf had started his survey (Graf pers. comm.). Some sections of road are visible to the south of Shaubak but this may be an Ottoman military road built on the Roman road (Glueck 1935, 89). The sites associated with the road are listed in Table 24 (page 427) and are set in order from north to south.

The *via nova Traiana* has never been excavated in this area and there has been no excavation of attendant structures. This means that use of the road has been determined from survey samples. Fiema has used the evidence (mainly from MacDonald's 1992 survey of the Wadi Hasa and his own 1993 Tuwanah Survey) of the lack of Byzantine structures along the road to demonstrate his view of a decline in long-distance trade in the later Roman and Byzantine periods (Fiema 1991, Figure 13 & 14 pages 348–349; 2002b, 133–134). In his model, this is linked to the decline in military sites supporting the road infrastructure, which demonstrates imperial disinterest in the area. This apparently fitted in with the dearth of milestone inscriptions after the third/fourth century (Watson 2001, 469).

#### Road & milestones

The *via nova Traiana,* as encountered in the DAS area, was extremely well-preserved in some areas apart from the section running south from Shaubak, which has been destroyed by the modern road that leads to Petra. The road is about 6m wide with kerbs and a central ridge. It was constructed from basalt or limestone blocks depending on the natural stone in the area. In general, the road follows the contours of the landscape, except below DAS 209/210 where it was terraced into the hillside and attendant water deflection measures were constructed. Also, from Shaubak southwards to Petra the *via nova Traiana* followed the base

of wadi systems where the road was heavily revetted into the wadi (see DAS 323 in Appendix 1).

Over 20 milestones were recorded at 11 locations (DAS 121–128, 133, 134, 139, 140, 141, 146, 149, 208, 382) through the Jibal and Ifjeij plain but none were located in the Shaubak area. Apart from DAS 382, which was located just to the north of DAS 209/210, all the milestones had been listed in Thomsen's catalogue of 1917. The inscriptions on these milestones and others provide proof that the road underwent a major transformation during Trajan's reign, just after the annexation (see Graf 1995).

### Associated structures

Nineteen structures are associated with the road, ranging from large forts to road stations to single structures (Map V Figure 88, page 408 & Map VIII Figure 91, page 411). The sites fall easily into these three distinct groups. The first group, DAS 210 and 160, stand out in their size and plan. Both are large and have distinct military layouts. DAS 160 has a definite barrack-type plan and DAS 210 has towers. The intermediate types are usually rectangular/square structures between 20 to 30m square in size and may have a small courtyard. As this layout tends to suggest a link with the larger *caravanserai* buildings, they have been interpreted as road stations. This is not certain in all cases but the regularity of location along the *via nova Traiana*, coupled with the presence of Classical period ceramics, favours such an interpretation. The final type of structure encountered along the *via nova Traiana* is the single small rectangular unit. There are no diagnostic elements associated with this type to provide any functional interpretation.

### Forts

Two main sites (DAS 210 and 160) have been identified along this stretch of *via nova Traiana*. The northern-most site, DAS 210, Khirbat Al Hodiah (Figure 104, page 429), was of immediate interest as it was not recorded by previous surveys. Lying about 4.5km to the south of the large site of Et Tuwanah (Fiema 1993, Kennedy 2000, 158–159), a large *caravanserai* site, the structure is situated on a ridge just below Jabal Hodiah (Map V Figure 88, page 408). It has excellent views to the north over Tuwanah, and the Wadi Hasa is clearly in view. The southern and western views are blocked by the mountain but the eastern view looks out toward the desert areas. The *via nova Traiana* snakes up the hill from Tuwanah and passes between this site and a smaller building, DAS 209, which is 25m to the west of DAS 210. The *via nova Traiana* clearly leads towards what would have been the entrance of DAS 210. Measuring about 60 x 40m, the remains stand to one course in height

and there are hardly any internal rooms visible. The wall width is about 1.60m. The towers are an integral part of the building and are about 6/5m square. There are extant ones on the north-west, south-west and mid-southern wall. Traces of towers exist on the south-east and north-east corners. The site was built on a slightly sloping limestone ridge, which is a strange situation compared to most level-based Roman forts. However, the need to have good views to the north and east was the determining factor in its situation. The lack of walls on the eastern side suggests either robbing or that it was never completed. The buildings to the west (DAS 209) did not have enough rubble to suggest that DAS 210 was robbed totally for their construction. However, there is easy access to this site from the main modern road and transportation to the villages of Buseirah and Gharandal is highly likely. The ceramic range from both DAS 209 and DAS 210 shows it was in use from the Nabataean to Late Byzantine period. While it is impossible to differentiate the ceramic range from both sites to assign separate occupational use, it was noted in the field that the sherd sizes picked up in the sample from DAS 210 were noticeably smaller than those encountered on DAS 209. It may be that the smaller sherd sizes denote dumping episodes and thus DAS 209 may post-date DAS 210.

The only other site of similar size to the south of DAS 210 is DAS 160, Khirbat As-Samra (Figure 105, page 430). Although first noted by Musil (Musil 1907–08 II, 1, 324 & 2, 237), in the 1930s, Glueck surveyed the site for ceramics (1935, 94–95; Site 181), although he called it Khirbat Es Semeira. He did not appear to see the significance of the site in relation to the *via nova Traiana*. Situated some 15km south of DAS 210, it lies on the edge of the Plateau about half-way across the Ifjeij plain (Map V Figure 88, page 408). The *via nova Traiana* passes immediately on its eastern face although the modern road has prevented the possibility of any secure identification. Numerous cisterns are located to the north and west of the site and a smaller structure and Islamic burial ground lie on the south side of the structure. It is a large site measuring about 70 x 70m. The walls survive to 2/3 courses in height (1.20–1.50m) and are 1m wide. The internal walls are usually about 0.80m wide. The plan is fairly clear and resembles military barrack types with smaller rooms around main walls and several separate structures within centre. However there are no towers. Within the south-west corner, a distinct structure, 9.5 x 9.5m, with an entrance in its north wall of faced ashlar blocks, is visible. This would appear to have been an earlier building that was incorporated into the later, larger structure.

The ceramic range for the site falls into two groups. It has ceramics from the Nabataean and Early Roman periods and then nothing until the Late Byzantine period when occupation

continues through to the Late Islamic period. Some of the later Islamic period ceramics may stem from the use of the burial ground. However, it seems fairly safe to assume that the layout of the site dates to the Roman period as most fortified sites of the Islamic period, on main routes in this area, conform to a courtyard plan (Peterson 1986, 1989). It is therefore tempting to attribute the smaller structure to the Nabataean period and view the larger structure as the Roman fort. However, the lack of towers presents a problem to this military interpretation. While Gregory (1996, 190–195) would question the use of towers in any structure to denote military function, the regularity of large Roman military sites in this area possessing towers is striking. At first sight, the site appears not to be built in a very strategic location. However, it sits across an easy route from the Plateau down into the Wadi Arabah across the Ifjeij plain to the desert areas, the modern Desert Highway and the Hajj route (see the Faynan–Dana route above). Indeed, a short distance to the north is a modern Jordanian military camp. Thus, the location and internal plan of this site leads one to assume it had a military function during the Classical period.

### Road stations

The second level of sites surveyed along the *via nova Traiana* was a distinct series of rectangular structures (DAS 112, 114, 136, 207, 209, 247, 339, 340, 341, 353) of a broadly similar size (see Table 25, page 431, in descending order starting from the northern-most site). Apart from DAS 209, which is opposite a fort (DAS 210), all the sites stood immediately adjacent to the *via nova Traiana* with no other structures nearby. Although the plans of some sites were indistinct, most appeared to conform to a small courtyard layout like that of DAS 207 (Figure 106, page 432). This structure was of particular importance as it was located at the junction of the *via nova Traiana* to modern Gharandal (ancient *Arindela*). This road to Gharandal appears not to have been paved but is a track that now leads to the modern road into the town from the east. Most sites showed no obvious layout changes but DAS 114 was clearly a smaller structure that was later enlarged (Figure 107, page 433). Most sites had a cistern or cave nearby which may have been used for water storage.

As can be seen in Table 25 (page 431), the date ranges fall solely within the Classical period. All apart from DAS 353 have Nabataean ceramics. However, as DAS 353 was situated 20m north of DAS 112, it would appear that one site superseded the other (Figure 108, page 434). They clearly demonstrate the heavy Nabataean use of this route. However, this type of site is variously interpreted in the landscape. Kennedy, in his corpus of Roman military sites, lists such sites as military road stations. For instance, the example of Rujm Faridiyyeh, first

surveyed by MacDonald (1988, 226, Fig. 59), serves to highlight this tendency (Figure 44, page 367). A rectangular structure, 36 x 42m, the ceramics date to the Nabataean and Later Roman periods. MacDonald listed the site function as military, which was echoed by Parker (1986a, 89–91) and followed by Gregory (1997 II, 369–70). However, this interpretation was not followed in the general discussion of military sites in Chapter 4.

Within the model of resource control in this study, these sites can be seen as part of the wider state domination of the landscape but do not have a clear military role. It is clear that they have different functions from the large obvious military sites. Of course, situated next to the *via nova Traiana,* the interpretation of an imperial function for the site may be allowed but, it seems by inference to be extended to sites elsewhere such as Khirbat Ail (Kennedy 2000, 170–171, Fig. 17.7) whose only military aspect seems to be its location on a hill. Killick (1986, 438), in an anecdotal observation, also noted that it was difficult to observe the difference between a fort and a fortified farm. This lack of definition means that attributing function on the sole basis of the plan of this type of site is incorrect and may create false indices of state control.

However, a major obstacle to site interpretation at this level is the lack of a Classical settlement hierarchy, no matter how crude. Rectangular structures of this size are a fairly ubiquitous feature of the Classical landscape and thus it is only by landscape or site context that any sustained interpretation can be constructed. While it is plausible to attribute a military function to such units along a clear road system, they differ in size and plan from fort structures such as Khirbat As Samra and Hodiah, discussed above. To term these structures as forts and group them with larger military structures does an injustice to the data. Historical evidence from *Itineraria* (Isaac 1992, 173–174), in both the eastern and western sections of the Empire, testifies to the diverse range of buildings along the *cursus publicus,* such as *stationes*, *mansiones* and *mutationes*.

### Single structures

The last type of site noted along this route probably defies interpretation. Consisting of smaller (compared to the road stations) single units, these sites were located in the southern Jibal and Shaubak areas which are closer to settlement areas. These sites (DAS 135, 138, 142, 143, 144, 147, 148, 324, 325, 342) have no obvious diagnostic plans to suggest a function. The ceramic range (see Table 24, page 427), lying mainly within the Nabataean to Late Byzantine period, makes them contemporary with the other site types and thus, overall, they seem to be linked with the Classical period road infrastructure.

The majority of sites along the *via nova Traiana* clearly demonstrate ceramic use from the Nabataean to Late Byzantine period (see Table 24, page 427). In Table 24, sites are arranged in descending order from north to south. The most striking observation is the absence of Iron Age and Islamic period sites. All but two sites (DAS 135 & 353) have Nabataean and Early Roman ceramics, indicating a significant Nabataean investment in this major route. However, contrary to Fiema (1991, 1993, 2002b), it is clear that the road was in use for the whole of the Classical period. This does not suggest that there were any problems in economic activity along this length of the road as suggested by Fiema. Moreover, as the presence of large scale forts at Khirbat Samra (DAS 160) and Khirbat Hodiah (DAS 209) makes clear, there were sizeable garrisons along the *via nova Traiana*. Therefore, in this area, there was a link between military garrisons and the *via nova Traiana* (*contra* Freeman 2001, 447; Lander 1986).

Freeman (2001, 433–434) and Graf (1995, 264) had already pointed out that major sections of the *via nova Traiana* had been used by the Nabataeans. Graf further states that "Trajan's *Via Nova* merely represented the formalising of the old Nabataean caravan route between Petra and Syria, not the creation of a new route" (Graf 1995, 264). However, to characterise this route in this way is to misunderstand Nabataean involvement. Nabataean ceramics appearing along this route do not simply show that it was used during the Nabataean period: they show that a clear material infrastructure was already in place to facilitate and monitor passage along this route.

While the Roman construction of the actual road is not in question, there has been no archaeological excavation of the road in southern Jordan to verify this. The milestones along this route declared "[Trajan's titles] *redacta in formam provinciae Arabia viam novam a finibus Syriae usque ad mare Rubrum aperuit et stravit* [Name of Governor]" (Graf 1995, 261) (Trajan...having reduced Arabia to the state of a province, opened and paved a new road from the borders of Syria all the way to the Red Sea). As Isaac (1992, 304) observes, *aperuit* does not indicate that the road is a new one but links the provincialisation of the area with the new road.

Mattern (1999, 114), in her study of Imperial Strategy in the Principate, was correct to emphasise the psychological impact of the new road as a symbol of Roman imperial power. However, her statement that the *via nova Traiana* was a vast and sophisticated structure in an "otherwise primitive and undeveloped countryside" is plainly wrong. Mattern clearly has little understanding of the Nabataean Kingdom. Even scholars with a closer knowledge of

the area use language that evokes the simple nature of the kingdom. Parker (1986, 118), when analysing the Nabataean defensive system, talks about a Nabataean Army that garrisoned mere posts and policed caravan routes. The language changes when discussing Roman forts and legionary bases as they policed roads (*ibid.* passim). Even Graf, normally highly aware of Nabataean history and archaeology (*cf.* Graf 1983, 1994), also characterises the pre-*via nova Traiana* road as a caravan route and one that the Romans formalised (Graf 1995, 264). It is clear that this route had a developed material infrastructure prior to Roman annexation. That the Romans substantially developed the road is without doubt, but to characterise it as the change from a caravan route to a formalised road is merely to accept the Trajanic propaganda presented mile after mile.

### Udhruh to Jarba to Nijil

While it was initially thought that Udhruh was on the route of the *via nova Traiana*, Graf (1995) has demonstrated that the road passed through Petra. This section of the *via nova Traiana* was presumed to follow directly north to the site of Khirbat Ed Doshaq, from where it could either pass north to follow the *via nova Traiana* or else swing east to join the routes along the desert edge. However, Khirbat Ed Doshaq (DAS 388), though a building of considerable size, is a Late Ottoman structure (Brünnow & von Domaszewski 1904, 98–99) and therefore could have no connection with a Classical road system. While the true route of the *via nova Traiana* is acknowledged, this route through Khirbat Ed Doshaq still features in road system reconstructions of the Classical period (*e.g.* Tsafrir et al 1994, see Figure 59, page 380). Although several milestones have been found to the north of Udhruh (Killick, 1986, 432 & Fig. 24.4), conclusive proof of a road has not been forthcoming.

While one of the milestones noted by Killick was found in fields to the north of Udhruh, the rest occur at the entrance to a major Islamic site near the village of Jarba. Four milestones were noted by DAS (DAS 388) at the entrance to the Hill of Arbitration at Jarba (Map VIII Figure 91, page 411). They are clearly positioned as markers for this holy Islamic site. While it is possible they come from a nearby route, it is more probable that have been brought from the *via nova Traiana*. The modern road broadly follows a route that comes out near Khirbat Ed Doshaq, but no ancient sites were discovered along its route. In fact, the only evidence for a route comes further to the west where several sites were noted along a route that comes out at Nijil. This route would make slightly more sense as there is a major spring at Nijil.

The ceramic dates for the sites along this route are listed in Table 26 (page 435). As one can see, the dates fall mostly in the Classical period. The route was only surveyed from the start of the DAS area at the junction of the Wadi Arja so its precise connection with Udhruh is

unclear (See Figure 144, page 484). However, from the Wadi Arja it heads directly northwards towards Nijil. Here, a tower site situated on a large hill (DAS 257), Rujm Arja, dominates the beginning of this route. Measuring 11 x 11.5m, it dates to the Roman period and has excellent views all round. However, there were hardly any ceramics lying about and it was thought that Killick may have sampled the area. From here the track moves north to an area where several clear agricultural buildings are located. These are DAS 384, 383, 258, and 259. Of these, DAS 259, Rujm Umm Oudmah, may have been a tower but the structure has been mostly destroyed. Of the others, DAS 258 is a large farmhouse, 52 x 31m, which lies adjacent to the modern track. Just to the north of this building, the track, which is about 2.5–3m wide, is lined by stones. This is not a feature of modern use and may relate to an ancient practice.

These sites lie on a series of slight ridges and the road lies below this to the east. These ridges run north for about 10km which means all routes and site distribution follows this feature. This is a feature of the geology in this area, which may have prompted Killick to note that tower sites were aligned on north–south lines and may be part of defensive systems (Killick 1986, 440). Killick clearly had not made the connection between these sites and a road system. Unfortunately, he has not published his data sufficiently to analyse his statements fully. DAS did not locate any lines of towers in this area but did note towers associated with the Khatt Shabib to the east (see below). However, Killick did not explicitly link tower sites with this feature.

There were three more sites noted along this stretch of track before it came to Nijil. These are DAS 275, 276 & 255. Of these, DAS 275 is the largest at 98 x 57m and lies adjacent to the track. Moreover, it is situated next to a known spring. The plan of the site has a series of rooms on the eastern and western side with the entrance on the western side facing the modern track. This is usually a feature of *caravanserais*. There are several other buildings to the east and south of this main structure that all date to the Classical period.

The next site, DAS 276, had a longer occupation from the Classical period to the Middle Islamic. Occupying an area of 16 x 50m it lies on a slight ridge immediately to the east of the modern track. Three kilometres to the north of this is the smaller site of DAS 255, a single square structure (7 x 7m) surrounded by numerous depressions which are shallow caves in the limestone bedrock. However, some may be cisterns. The site has ceramics from the Classical period only.

From DAS 255 the track veers to the north-west and heads towards an ancient settlement site, DAS 295, Khirbat Nusraniyah, which was occupied from the Early Roman to the

Middle Islamic period. The site is situated on a hill above the track that now follows a wadi system towards Nijil. Just before the modern junction of the Petra–Shaubak road and the road to Shaubak castle, two sites were noted. DAS 401 is a single structure, 12 x 10m, set on the edge of a wadi about 50m south of the modern junction. It had an occupation from the Classical to Middle Islamic period. However, 10m to the east of this structure, lying beside a shallow wadi, were the remnants of an old track. It consists of two parallel lines of walls that are 2m apart. The upper wall line is about 1m high and is slightly terraced into the hillside. The track can be followed from DAS 401 south for about 250m when it stops in an area of modern field clearance. However, it is clear that it would once have headed for the Petra–Shaubak road where the *via nova Traiana* also runs.

### Discussion

This possible track was the only Classical indication of a route heading from Udhruh north to Nijil. The sites along it have no military function. However, sites such as DAS 275 are clearly not agricultural farms, but may be *caravanserais*. The route's use is predominantly Classical, although one should note that the bulk of evidence comes from a distinct concentration of sites near the Wadi Arja and thus may not relate solely to road use.

## Desert Highway or 'Via Militaris'

The second main route on the Jordanian Plateau is one of fundamental importance to the history of the region. Known popularly today as the Desert Highway, it is the main route from the capital, Amman, to Aqaba and also to Saudi Arabia. It is the annual pilgrimage route from Damascus to Mecca and carries hundreds of thousands of pilgrims every year. The Islamic forts distributed along its length have been investigated by Peterson (1986, 1989, 1994 & 2003). DAS carried out a survey of the routes from Ma'an to Wadi Hasa (See Figure 144, page 484 based on Map III, Figure 86, page 406; Map VI Figure 89, page 409 & Map IX Figure 92, page 412). The ceramic dates for these sites are presented in Table 27 (page 435).

Isaac (1992, 128) postulated that, in the area around the Wadi Hasa, there should be evidence of a route to the east of the *via nova Traiana*. A line of milestones had been found between Wadi Hasa and the fort of Dajaniyah by Brünnow & von Domaszewski (see Thomsen 1917, 57–8; Nos. 177–184, also Figure 5, page 319), and others were found near the great fortress site of Udhruh to the south (Thomsen 1917, 56; Nos. 172–173). This led scholars to suggest that this was an outer branch road of the *Limes Arabicus* (Parker 1986a, 91). On most maps this road is drawn as it passes from Hasa to Jurf Ed Darwish through Dajaniyah (DAS 200)

onwards to Udhruh (*e.g.* Parker 1986a, see Figure 7, page 321), and this interpretation of the route has been widely accepted (Fiema 1991,1995; Tsafrir *et al* 1994). The logic, somewhat crudely summarised, is: line of milestones plus proximity of forts equals road system therefore military system.

In Killick's survey (1986, 433 fig. 24.1) there is a route from Jarba fanning out to the desert that connects with the site of Khirbat Dajaniyah and this supposedly links with the line of milestones to the north. However, no ancient features of Killick's road infrastructure were found by DAS. The only site in the area, DAS 320 (Map VIII Figure 91, page 411) is a small site and does not indicate any evidence of road stations etc. that are usually found on the main routes. In fact, given such slight evidence for the route, it is not surprising that there is little explanation for its presence other than a service branch road for forts (Parker 1986a, 91). However, it has never been satisfactorily explained why this "bulge" of forts is located in this area.

While acknowledging the existence of the milestones, David Graf (1997a, 1997b) has questioned the presence of a road system on the edge of the desert areas linking military sites: a so-called *via militaris*. In reviewing the evidence, Graf suggested that the line of milestones leading to and from the site of Jurf Ed Darwish (DAS 235, Figure 109, page 436) (see Parker 1986a, 91; Kennedy 2000, 159), supposedly a small *castellum*, really only marked the approaches to this fort. However, it must be pointed out that there are no obvious military features apparent in its layout (Findlater 2002, 140). The site is about 35 x 35m and the entrance may be on the western side. The date range obtained on the DAS ceramic survey is Early Roman to Early Islamic. Parker's survey obtained the following dates: 12 Late Roman II–IV and two Early Byzantine I–II sherds (Parker 1986a, 178–9). The site, contrary to reports that it is buried in alluvial silt (Kennedy 2000, 159), has probably been extensively robbed for the nearby settlement and railway station of Jurf Ed Darwish. The thickness of the walls noted by Brünnow & von Domaszewski (1905, 14), at 1.7m, were considered a defining feature in attributing a military function to the structure. However, this feature was considered by DAS to be a confusion with internal features (Findlater 2002, 140). There is a clear dip in the middle of the site and this leads one to suspect that the rooms are arranged around the internal wall faces. On the north-west and south-west corners short wall lines may suggest towers, but the evidence is light as the main wall faces are hard to discern and the other two corners do not suggest this.

Thus, the "fort" at Jurf Ed Darwish may correspond to a courtyard layout but the function can be interpreted in many ways. Parker (1986a, 91) linked it militarily with the tower, Qasr

El Bint (DAS 236) (Parker 1986a, 91–92) on a hill 700m to the east (Figure 103, page 429). Although unquestionably a tower, Parker's survey obtained dates from the Nabataean to the Byzantine period (Parker 1986a, 178–9). Thus the tower appears earlier than the main "fort", which, in a purely functional sense, is illogical according to Parker's hypothesis. It would follow that the tower would post-date the fort. In fact, the tower's only association with a military feature is its proximity to a "military road" that supposedly led to the fort of Dajaniyah and then to the fortress/town of Udhruh. Certainly, Thomsen's plan of milestones in the area, based on Brünnow & von Domaszewski's field data, would point towards such a route (Thomsen 1917, Tafel 1; see Figure 5, page 319) (Findlater 2002, 140).

Graf, however, (1997a, 128) suggested that the direction of the milestones did not indicate a route leading to the fort of Dajaniyah (DAS 200) (Parker 1986a, 93–94; Freeman 1990). He believed the route lay closer to the modern route. However, the lack of an archaeological date, apart from the milestones, created problems for this view. Although one could not expect a paved route, a cleared desert track would be usual and is paralleled elsewhere. Further, if the track did not go to Dajaniyah as the topography indicates, the lack of military/state structures directly to the south (such as towers etc) would suggest there was no major route heading south – military or otherwise (Findlater 2002, 140).

However, DAS did locate two sites to the south, which began to provide the evidence for the material infrastructure of such a route. DAS 211, a small tower (6 x 6m) was located 5km south of Jurf Ed Darwish. Built of walls 1.20m thick, it is intervisible between the tower site of Qasr El Bint (DAS 236) and the next site discovered, DAS 217 (Figure 110, page 437). Known as Abu Hitana, this was a square structure (18 x 18m), 5.5km south of DAS 211, which is on a hill overlooking the modern junction and road to Jafr from the Desert Highway. DAS 211 dates from the Late Roman period to the Late Byzantine while DAS 217 had earlier first century BC/AD Nabataean sherds through to the later Byzantine. These structures follow the line of routes along which the modern roads follow.

More significantly, located 30m to the west of DAS 211 was a stretch of cleared track that was not made by vehicles or graders (Figure 111, page 438). Eight metres wide, lined with stones, and situated to the east of the Hejaz Railway, it was first thought to be a service track linked with the railway. The tracing of this route (DAS 213) confirmed its ancient status as it was on the same route as the milestones noted by Thomsen (1917, 58, Nos. 177–181 & 182–184). Sections of this track were noted south of Jurf Ed Darwish, stretching to 1km south of DAS 217, but then it appears to have been destroyed by the Hejaz Railway. This route was associated with a line of milestones (DAS 319, 216, 215?, 214, 212) (Map VI Figure 89,

page 409). To the north of Jurf Ed Darwish, *en route* to Wadi Hasa, similar fragments of track were located which were not associated with the railway track and six sets of milestones were located along this route (DAS 318, 314, 315, 316, 313, 317). It is worth emphasising that groups (up to five) of milestones were located, suggesting repeated use of the route (Map VI Figure 89, page 409 & Map III Figure 86, page 406) (Findlater 2002, 140). This section of track was clearly heading towards the ancient site of Ar Ruweihi (MacDonald 1988, 211 Fig. 55; see Chapter 4). Several milestones and towers were associated with this route. However, they were not recorded fully as this area was outside the permit zone of the project.

This route was the original line of the Hajj route, which was distinguished by stone piles denoting graves of pilgrims who died on the way. It should also be noted that a series of large circular enclosures was surveyed along this track. Two are located on the 1:50,00 Map to the north of Ar-Ruwehi (Qasr Abu El Inaya, Sirat Umm El Hayan), and one was noted just to the south of Ar-Ruweihi (Map III Figure 86, page 406). DAS surveyed another one about 5km south of Jurf Ed Darwish (DAS 390) (Map VI Figure 89, page 409). Consisting of a low wall (0.20m high) and enclosing an area *c.* 400m, it seems to have been for keeping stock. One should also note the example found within the rural landscape around Dana, DAS 167, and located just to the east of the *via nova Traiana* (see Chapter 9). Although the Desert examples probably date to the period of the Islamic Hajj traffic, when massive flocks of sheep/goats accompanied the pilgrims, there were no diagnostic elements to establish a date.

As with the modern Desert Highway, most routes would travel south and then turn west along wadi routes if heading towards the mountains of the Shera'a, as this would present a more efficient form of travel. Therefore, it would be reasonable to assume that this Classical route followed the same route as that which heads towards Ma'an today. Unfortunately, to the south of the Wadi Hasa/Jurf Ed Darwish area, the modern Hejaz Railway has obliterated any evidence that could confirm the presence of this route. Moreover, it is difficult to prove this when there are no reported Classical sites along this track. Earlier travellers (quoted in Brünnow & von Domsazewski 1905, 7–8) reported that this stage could be achieved in half a day from Ma'an to the Ifjeij area, so it may be that sites were not required. However, this neither explains the sites to the north, nor the length of track with associated milestones. The only site known along this route, south of DAS 211 and 217, was Qal'at Unaiza (Map IX Figure 92, page 412 for location) (Findlater 2002, 140).

Qal'at Unaiza (DAS 389 Figure 112, page 439) was built, according to historical sources, in 1576 as part of the Hajj system to protect pilgrims en route to Mecca (Peterson 1986, 1989).

It is 33km to the north of Ma'an which is the main transit point for travellers into Arabia, both today and in ancient times. The site is dominated by a black basalt hill to the west, Jabal Unaiza, that overlooks the site. On this hill several structures (DAS 201) containing Classical pottery, and which had been disturbed by modern military use, were noted. This led to a re-examination of the Ottoman fort in 2000 by DAS. Several features that had not been noted in earlier surveys by Peterson (1986, 78–85) were immediately apparent (Findlater 2002, 140–141).

The asymmetric entrance of the courtyard structure is unusual, as entrances in this type of plan were usually placed halfway along walls (Figure 113, page 440). At the corner of the south-west curtain wall an obvious rebuild phase was apparent. This meant that the southern wall would have continued west, as part of a larger structure not noted in earlier surveys. From the re-surveyed plan it is obvious that the 1576 construction is actually a drastically smaller rebuild of an earlier structure. Further examination noted the differences in room size between the rooms on the east and south faces, and those on the north and east. It was also noted that different cement was used in the construction of both sizes of room. The re-surveyed plan now shows an earlier larger structure where the entrance fits more symmetrically into the plan. The plan suggests a large courtyard outline (perhaps a *caravanserai* layout). A careful sherding of the area found ceramics from the Classical and early Islamic periods and from the nineteenth century (Findlater 2002, 140–141). Peterson (2003) has now noted the presence of a Classical period building.

## Discussion

It is now highly probable that Qal'at Unaiza was another large Classical site, possibly a *caravanserai*, on an ancient road that leads to the Ma'an oasis. The evidence the DAS has accumulated shows a definite cleared track associated by proximity with 10, possibly 11, milestones and over six military/state sites or at least regular square structures of varying size. However, one should note that this, of course, represents a palimpsest of activity where none of the sites should be viewed as contemporary. The main point to emphasise is the spatial association of sites (which all contain Roman/ Byzantine pottery), proving the existence of a formal Roman route to the east of the *via nova Traiana* (Findlater 2002, 141). As one can see from sites like Qasr El Bint (DAS 236) and Abu Hitana (DAS 217), there was a clear Nabataean presence along this route. However, in contrast to the *via nova Traiana*, these Nabataean sites acted as monitoring sites only as they were situated on hills. The larger main structures directly associated with the line of the route are all later Roman in date, such as Jurf Ed Darwish (DAS 235) and Qal'at Unaiza (DAS 389). There is, therefore,

enough evidence to suggest that in the Roman period a major effort was made to construct a formal route here with all the infrastructure of a major imperial road that probably ran the edge of the desert areas.

Furthermore, this route can now be seen as the precursor to the Hajj route (Peterson 1989), which probably headed for Ma'an. However, this route is not directly associated with the military sites of Dajaniyah or Udhruh (Parker 1986a, 94–98). One cannot now argue for a *via militaris* since the two major military sites in the area have no physical connection with it. However, this is not to deny a connection between these sites and this route. That the personnel of these obvious military sites would have patrolled or monitored this route is without question, but it is clear that the sites were not constituted in the strict traditional interpretation of a *limes* system as forts linked by a road. The main point to note is that the line of forts is to the west of this route. However, it must also be noted that the larger military sites like Dajaniyah and Udhruh may have been positioned with greater consideration for the need to harvest large quantities of water than for specific tactical requirements (Findlater 2002, 141).

### Cross-routes between the *via nova Traiana* and the 'via militaris'

This section will describe the main routes between the *via nova Traiana* and the Desert routes in the DAS project area. In essence they are still the same today. The geography of the land is such that the mountains of the Jibal and Shera'a still force travellers along routes over plains and through wadis. At the northern edge of the project area one must note that from the site of Jurf Ed Darwish the modern road leads to Gharandal. Although there is no archaeological evidence, this could be a possible cross-route between the two road systems. At the southern edge of the project area there was a route from Petra to Udhruh and out to Ma'an. A road extended south-west from Udhruh towards Sadaqa where it joined the *via nova Traiana* (Graf 1995, 1997a).

Within the project area, the main route between the desert areas and the mountains was across the large plain known as the Tawil Ifjeij (See Figure 144, page 484 based on Map V Figure 88, page 408 & Map VI Figure 89, page 409). This area stretches from the semi-arid desert areas across to the edge of the Jordanian Plateau and separates the area of Jibal to the north and the Shera'a to the south. As was noted in the *via nova Traiana* section above, the main Roman road follows across the edge of the Plateau across this plain where a large Roman fort, Khirbat Samra (DAS 160), was situated. DAS 160 was also on a route up from the Faynan (Wadi Arabah) area through Wadi Hammam and up across the Beda area. The old road between the Desert Highway and the King's Highway ran east–west to the north of

DAS 160, and the new road from Petra through Shaubak (which follows the old Ottoman railway) cuts out to the east and joins the main highway near Qal'at Unaiza (DAS 389) (Map IX Figure 92, page 412). Thus, the area has always been a convenient and easy access into the Plateau areas. As such, several large Roman forts are located in this area. The ceramic dates for these sites are listed in Table 28 (page 441).

The largest of these is Khirbat Dajaniyah (DAS 200), located 13km south-west of Jurf Ed Darwish and about 12km west of DAS 160 and the *via nova Traiana*. The site (Figure 102, page 428) is over 100 x 100m and has corner and two interval towers on each wall, except the east which has four. There is a large reservoir situated to the south-east that was fed by water run-off from Wadi Dajaniyah. Although extensively mapped by Brünnow & von Domaszewski (1905, 8–15), it was not properly surveyed for ceramics until Parker (1986a, 93–94, 178–9) established a date range from the Early Roman to the Late Byzantine period with some later Mamluk/Ottoman use. Later it was properly surveyed by Freeman (1990) who improved on the original Brünnow & von Domaszewski plan. However, Parker (1991) carried out selected soundings inside the fort on the inner main wall, within the supposed *principia* and some barrack rooms. He established a possible construction date of *c.* AD 300 with occupation lasting until the fifth century. Freeman (1990) and Gregory (1997 II, 376–382) have questioned some of Parker's and Brünnow & von Domaszewski's assumptions and observations. While some have discussed its architectural features etc., (Lander 1984, 144–145; Welsby 1998), it is not the intention here to critique the excavation of the building or the specifics of the site. Rather, it is to analyse its position in the landscape, which has never been fully addressed.

However, in this respect, interpreting the landscape function of Khirbat Dajaniyah is problematic. While it had been assumed that Dajaniyah was linked by a desert road to the main military site of Udhruh, then a more conventional interpretation as a *limes* system seemed obvious. However, as has been shown above, the Desert route does not go through Dajaniyah and, moreover, it predates it. Khirbat Dajaniyah is an extremely large fort – only the legionary sites of Udhruh and the Lejjun are larger – therefore the position of the fort on the Ifjeij plain may be more due to local factors rather than the presence of this desert road.

The importance of the Ifjeij plain is made abundantly clear by the discovery of a new fort at a site called Khirbat Qannas (DAS 193). Located 9km south-west of Dajaniyah and 11km west of Shaubak, the site was first noted by Zayadine and Graf (Graf 1997a), who did not realise its military significance (Map V Figure 88, page 408). Kennedy noted the site in his corpus of Roman forts (Kennedy 2000, 163–4) but, on the basis of his aerial photos,

misinterpreted major parts of the site. The ceramics (See Table 28, page 441) from the main site (DAS 193) and the field system (DAS 194) date from the Nabataean to the Late Islamic period. DAS surveyed the site and associated features, revealing a fort layout with external towers to which a courtyard building was later added (Figure 114, page 442). Clear black dump deposits were noted immediately to the north of the sites. In addition, a small cross-wadi field system (500 x 100m) was situated immediately to the south of the structure (DAS 194). In Kennedy's interpretation of the site he noted a major settlement, to the north and west, between the fort and Wadi Dajaniyah. However, the ground survey by DAS found only 40 large bell-shaped cisterns (DAS 196). Two hundred metres east-north-east of the main site is a small cemetery (DAS 195). Although extensively robbed, over 80–100 graves were noted over an area 50 x 80m.

The main building covers an area 102 x 37m and comprises two distinct phases. The western part is clearly a fort measuring 70 x 37m with corner and mid-towers (5 x 5m). The walls are about 1.40m wide. The internal arrangement of the building is on one axis along a central east–west road leading to a larger internal structure. The internal arrangement is of small rooms with sub-divisions ringing the walls, while larger structures predominate in the interior. The eastern structure is clearly a later addition as the eastern wall of the main fort and the south-east tower has been extensively destroyed. The eastern structure is a courtyard plan measuring 32 x 37m with rooms on three sides. The connection of a clear fort site with a courtyard site does suggest different uses for each.

Khirbat Qannas is only 10km west of the fort of Dajaniyah (DAS 200) and about 4km east of Khirbat Samra (DAS 160). The connection between these three sites and their development is highly important as nowhere else on the Plateau or Wadi Arabah does one see such a concentration of military sites. Both Khirbat Qannas and Dajaniyah lie on the banks of the Wadi Dajaniyah, an effective route from the Desert Highway across the Ifjeij plain to the *via nova Traiana* where Khirbat Samra is located. Thus, one could argue that it fulfils the function of protecting a route. In fact, Khirbat Qannas, with its additional courtyard building, may have been a *caravanserai* just as Khirbat Samra may have been on the *via nova Traiana*. However, neither Khirbat Qannas nor Dajaniyah are located on nodal communication points, although they are probably on a route from Petra to the desert areas (Zayadine 1992, 229). Khirbat Samra certainly lies on the *via nova Traiana*, but it also lies at a junction with routes coming up from the Faynan area. All these sites, situated as they are on a wide plain offering easy access to the agricultural areas, would fit the purely military model proposed by Parker. They would have contained substantial garrisons. Moreover, the

fort at Dajaniyah was large enough to contain a large cavalry force that could have easily dominated the plain (Parker 1986a, 94). It can be argued that although this may be seen as a response to incursions, the size of the Dajaniyah garrison (based on the size of site only) is larger than most military sites in this area. However, a sustained nomadic presence does not account for the presence of three sites, along the same latitude within an area of 20km. Rather, other factors are likely to account for the presence of such large military sites, which will be discussed in Chapter 8 (Findlater 2002, 143).

### Khatt Shabib: landscape of defence?

The reinterpretation of the position of the fort of Dajaniyah prompts the question, if the site is not on a military road, what is the purpose of the site? The site may be seen in a blocking role defending the easily accessed Ijeij plain. However, as was noted in Chapter 2 and highlighted by Chapter 4's review of military sites in Jordan, Roman military sites were rarely situated in lines of linear defence. In this context, much of the problem of the archaeological identification of a frontier zone in southern Jordan is that it is very hard to operationalise in a material context. Namely, what set of physical remains constitutes a frontier zone? As more recent studies have attempted to view frontier areas as zones of cross-cutting social networks (Lightfoot & Martinez 1995, 474), it is hard to see many frontiers purely as boundary maintenance systems.

The evidence of nomadic raiding and the location of military sites on the steppe fringe, however, has led to the strong impression that this type of frontier existed during the Classical period (Parker 1997a). Nomadic threats are seen as "external", although the evidence for tribal dynamics in this area is very sparse (Millar 1993, 428–436). Similarly, it is assumed that the Roman military would seek to protect the settled (internal) Mediterranean areas on the Plateau edge. The evidence can be used both ways and comparisons with other areas in the Empire may be invalid given the specific social and environmental factors at play here. However, within the DAS area there is some evidence for a boundary system that, if correctly identified, can clearly highlight the absence of linear defence in the Roman and Byzantine period.

The Khatt Shabib is a 20 to 30km stretch of walling first noted by Kirkbride (1947–48) and Zeuner (1957) (Figure 115, page 443). Running from the edge of the Ras En Naqb to just east of Ma'an, its date and function is unknown although Kirkbride noted that local traditions attribute it to an Islamic Prince. Parker and Killick both suggested it could be similar to walls seen in the Roman North African provinces that acted to block or control nomadic tribes (Parker 1986a, 86; Killick 1986, 432–436) (Findlater 2002, 142). Harding (1967, 154)

postulated that it was a defence against cavalry but this was dismissed by DAS because in many places the wall was either not high enough or was situated at the bottom of slopes. The wall was subsequently noted by MacDonald in his surveys to the north of the DAS project but he seems unaware of its significance (see MacDonald 1999).

### A reinterpretation

DAS tracked this line from Kirkbride's area to the Wadi Hasa where it stopped, a distance of over 90–100km (See Figure 143, page 483 based on Map III Figure 86, page 406; Map VI Figure 89, page 409; Map V Figure 88, page 408 & Map VIII Figure 91, page 411). The full description of the wall is contained in Appendix 1 DAS 219. This would make it one of the largest monuments in southern Jordan and constitutes a major discovery. It means that at some point in antiquity a wall ran along the whole eastern upland edge of the Jibal and Shera'a mountains. Kirkbride also noted that it runs along the 100m-isohytal line for dry farming (Kirkbride 1947–48, 266–267) and the DAS evidence fully bears this out (Findlater 2002, 142). Thus, it represents a boundary between the desert and the sown.

The date of the wall is unknown and the only structures physically associated with it are occasional small enclosures, most of which do not produce any dating material. On the ground, the Khatt Shabib manifests itself as a low rubble wall (or in places orthostatic stones) about 0.60 – 0.90m wide (Figure 116, page 444) (Findlater 2002, 142). However, there is a series of more substantial structures that lies very close to the wall along the length surveyed by DAS. They are listed in Table 29 (page 445). They represent towers, tombs, enclosures and single structures, and are situated on the line or close by the wall. While the relationship of these sites to the Khatt Shabib lacks a direct physical relationship, it is presumed that the close landscape relationship denotes a contemporary use. As one can see from Table 29 (page 445), the predominant date of the sites along the wall is Classical. However, Khirbat Qannas, the only major Roman fortification that appears on the line of the Khatt Shabib in the DAS project area (Figure 114, page 442 DAS 193; also Fig. 16.9 Kennedy 2000, 163), is not connected with the wall. The wall stops a kilometre either side of the site, which suggests it was robbed for construction of the fort. Kennedy notes this feature in Classical sites to the south (Kennedy forthcoming). Further, at a point closer to the Wadi Hasa the wall was cut by the *via nova Traiana* which clearly suggests a pre-annexation date (Map III Figure 86, page 406).

As Table 30 (page 445) shows, the main type of site encountered along the wall line is towers. These are DAS 231, Jabal Qirana; DAS 230, Rujm Bahash; DAS 238, Tell El Jueheira; DAS 226, Tawil Ifjeij (or Jabal Dajaniyah), and DAS 202, 222, 223, 205, 237 &

203. Previous researchers have surveyed several of these sites. Thus, Glueck (1935, 96–97) surveyed Tell El Qirana where he noted Iron Age and Nabataean sherds. Hart subsequently surveyed the site and confirmed this with similar material (Hart & Falkner 1985, 270 Site 110). At Rujm Bahash Glueck noted quantities of Iron Age ceramics with some Nabataean sherds (Glueck 1939, 23). At Tell El Juheira Glueck found mostly Iron Age ceramics with some later Nabataean material. This was again confirmed by Hart (Hart & Falkner 1985, 270 Site 109). At the site of Tawil Ijeij Glueck noted large quantities of Iron Age ceramics with some later Nabataean and "Arabic" sherds. This again was confirmed by Hart's survey (Hart & Falkner 1985, 270 Site 108). These results have been put into a table with the DAS data, which shows the full range of ceramics gathered by all surveyors. It must be said that Iron Age, Nabataean and glazed ceramics were well known to Glueck and their attribution (although not ceramic date) certain. Hart's results are based on the material from Khairy's excavations at Petra and thus are fairly certain in their attribution (Khairy 1975 quoted by Hart & Falkner 1984, 256; see also Khairy 1980, 1982).

While it is clear that all sites were variously occupied from the Iron Age to Late Islamic period, more sites were occupied in the earlier periods. However, one should note that most were already occupied in the Iron Age. If one allows that the wall predates the Roman period for the reasons noted above, then it follows that it can only have been built during the Iron Age or Nabataean period. As was shown in the section above on the Desert Highway route, there are Nabataean sites located much further out but there are no Iron Age sites. Thus it seems that the Khatt Shabib line may represent an Iron Age boundary that is spatially associated with a series of tower sites. Although the wall is not physically associated with the line of towers, it would be reasonable to assume that it dates to the period when most towers were in use. The main point here is to observe that the placement of the wall along the edge of the mountain range, and the siting of the towers, all in line of sight and with very little hidden ground, strongly suggests the maintenance of a boundary area.

Glueck had already put forward the notion that the eastern side of the Edomite kingdom was guarded by a series of tower sites (Glueck 1934, 71; 1939 24–25). However, recent Iron Age scholars (*e.g.* Bienkowski 1992) contend that the Edomite Kingdom did not have the capacity for such a level of military control. While the nature of the Edomite state is disputed, the existence of the line of towers observed by Glueck has been confirmed by the DAS. Thus, during the Iron Age, the Jibal and Shera'a area, with its Mediterranean environment, good springs and agricultural land, was delimited and monitored.

While it is clear that tower sites continued into the Classical period and beyond, the question is to what extent they were associated with this line during later periods. It can be argued that they still retained a security function, which would complement Parker's argument that the line of forts existed as a defensive agency. However, the alterations noted during the Roman period when sections may have been robbed for use in major sites (*e.g.* Khirbat Qannas), or cut by the line of the *via nova Traiana*, suggests that the wall's primary function did not continue. Equally, the existence of major Nabataean and Roman sites to the east of this line suggests it did not function in such a dramatic way as during the Iron Age. Thus, Roman military use of the landscape did not employ the only defensive line that runs along the eastern edge of the Plateau.

## Conclusion

The overwhelming evidence from Chapters 3 and 4 demonstrates that the Romans positioned most military sites on nodal communication points. Moreover, this study has shown that they have been demonstrated on the ground, without reference to postulated connections between known military sites. The detailed study of routes in the DAS project area has shown that the Romans used the Nabataean road infrastructure. Although the *via nova Traiana* is traditionally seen as a primary construction by the Romans, it is clear that many of the road stations, *caravanserais* and structure along its route were used in the Nabataean period. This evidence seems to confirm, along with the data gathered in Chapter 4, that the Roman military/road system was rooted in an older pattern of landscape use.

The only major fort in the survey area that does not lie on a major route is Khirbat Dajaniyah. Parker (1986a) views this site as lying on a military road heading north from Udhruh to Jurf Ed Darwish. However, the existence of this road was questioned by Graf (1997a & b). Nevertheless, the delineation of this desert road as a major route was confirmed by the DAS. However, the route has no physical connection with the fort of Dajaniyah. The other so-called forts along its route (*e.g.* Jurf Ed Darwish) are better characterised as road stations. Moreover, the discovery of a substantial Classical building underlying the Hajj fort at Qal'at Unaiza, suggests that the road was heading for the major settlement at Ma'an to the south. Thus, the road was not designed as a major military route linking forts. In fact, the route clearly followed an earlier Nabataean line of towers (Qasr El Bint, Abu Hitana etc.), which, once again, demonstrates that the Roman pattern of landscape use is not new. However, one should emphasise that the Roman use of this route was substantially greater than the Nabataean use, as major forts and road stations were built during the Late Roman period.

However, of these, Dajaniyah can no longer be seen as part of a *via militaris,* in the way that Parker viewed it, as one in a line of forts linked directly by a road system. However, its relationship with Khirbat Qannas, and their place in a wider landscape setting of settlements and land use, may suggest other functions for Roman military sites. The line of forts during the later Roman/Byzantine period along the desert fringe and linked by a road system is not a frontier in administrative or even military terms. The clear presence of garrisons along the *via nova Traiana,* and the subsequent shift to the desert route in the later Roman period, suggests a major shift in a pattern of communication routes rather than a response to external military pressure.

The definition of an earlier Iron Age boundary system of towers and a linear wall shows that a linear defensive system can be achieved in this landscape. The Khatt Shabib runs along the eastern edge of the Jibal and Shera'a mountains and is monitored by a system of towers. While there was Classical occupation along them, it is argued here that this occupation was not tied to the maintenance of this line. Thus the Romans clearly had no use for the only natural defensive position in this landscape.

# Chapter 7

## Analysis of settlement continuity in the landscape

### Introduction

The main aim of this chapter is to analyse the relationship between military sites and the rest of the settlement system. This will be achieved using primary survey data from the DAS as outlined in Chapter 5. The analysis will use the ceramic dates obtained from field samples to present a picture of settlement continuity or discontinuity. This will be further correlated with site function. The first part of the DAS analysis will deal with all sites from the prehistoric to the Late Islamic period, first over the whole DAS project area and then by each of the five sub-regional units. The second part of the DAS analysis will deal with all Classical period sites, then focus on Structural sites (towers, settlements, farmsteads, forts etc., as defined in Chapter 5) within this period, ordered by type for the whole area then by each sub-regional unit. This is the first time that such an approach has been attempted for military sites in this area and represents a clear break from the overtly descriptive analyses offered to date.

The results of the DAS settlement pattern analysis will then be correlated with similar data from four of the largest surveys in southern Jordan that have complete published reports. These are: the Wadi Hasa Survey, the Southern Ghors and North Arabah Survey, the Limes Arabicus Survey and the Kerak Plateau Survey. The geographical extent of this dataset is vast and means that an area from just north of Petra to the Wadi Mujib can be tested (Figure 118, page 447). The analysis of these projects will be done using the same methods as outlined for the DAS.

### Research background

Chapter 6 clearly demonstrates that military location in the DAS project universe was neither linked to a need to combat aggressive external forces nor to keep down a subject population. To understand the motivation for the military distribution of sites, one must investigate the wider socio-economic framework. The close connection between military sites and the road infrastructure throughout southern Jordan and Israel suggests a deeper integration with the economic activity of the province.

Many scholars have attempted to link the wider economic interests of the province with military locations. Isaac (1980) attempted to show the development of Roman rule through

the variation of trade routes in *Arabia*. This view saw the movement of Trajan into Arabia as essentially an economic imperative to maximise imperial revenues (Eadie 1985, 1986 & 1989). However, more recent studies have sought to emphasise the dislocation of imperial control and the provincial economy. Young (1997, 2001), in a wide ranging study of archaeological data for trade in the Roman Near East of the first three centuries AD, demonstrates that the government had little interest in trade beyond a determination to gather tax revenue. This is supported by the view of Lintott who, in his textual study of the government of Rome, concluded "it would be rash to see a single economy in the empire and to use the economic interests of the provinces as a justification of the perpetuation of the empire" (Lintott 1993, 189).

Nevertheless, economic activity of trade and markets is used to suggest a pattern of correlation with imperial activities. Most notably, Whittaker (1994) has used a combination of archaeological and textual data to build a picture of a distinct frontier economy that influenced the political and military patterns of the imperial government. However, as noted in Chapter 2, Whittaker's use of archaeological data is unsophisticated (Freeman 1996b). Within Jordan, Fiema has suggested a correlation between economic variability and military location (Fiema 1991). Unfortunately, his work has not been fully published (*cf.* Fiema 1992) and the results of his research are undervalued. Nevertheless, as was noted in Chapter 2, Fiema's work stands out as the only systematic attempt to integrate military data within a wider socio-economic framework.

Fiema (1991, 44–60) argued that military strength in southern Jordan would vary in accordance with the economic importance of the area. He identified long-distance trade as a prime factor in the rise and fall of settlement demographics when periods favourable to long-distance trade should show a "hierarchy of site locations and defensive works reflecting general regional control, but with a focus along major international lines of communication" (*ibid.* 55). Conversely, in periods when long-distance trade dwindled there was a direct correlation with a decline in military and settlement sites. According to Fiema, these phenomena can be seen at a regional level through archaeological survey data. Fiema also stated that this variation would also be found in the quantity and quality of artefacts on site and therefore emphasised the presence of exotic goods (brought through long-distance trade) such as fine ware sherds and coinage.

Fiema concluded that careful analysis of the archaeological material, when correlated with historical facts, demonstrates the validity of his hypothesis throughout the whole history of the province. Using mainly field survey data, he showed that there was such a link and that it

could explain the breakdown of the military and political networks prior to the Muslim invasions in the early seventh century (see also Fiema 1995). He viewed this variability through identified breaks in settlement pattern – mainly by noting breaks in ceramic record (see his range of maps, Figure 11–14, pages 325–328). Fiema, while reviewing the settlement record of southern Jordan, based a great deal of his evidence on survey data from MacDonald's Wadi Hasa Survey (MacDonald 1988). Fiema had worked with MacDonald on this survey and his resultant analysis seemed to confirm MacDonald's view of a varied settlement pattern through the Classical period. Fiema (2001a, 2001b, 2002b) has followed this up in various studies that have sought to elaborate on his original premise that after a Nabataean/Early Roman floruit there was general economic decline until the Late Byzantine period. At that time long-distance trade had ended and there was a smaller regional trade with the Hejaz (*cf.* Crone 1987). As was noted in Chapter 6, Fiema had attempted to show that the regional road system had declined as a result. However, the data from the DAS suggests that the road infrastructure was intact until the Late Byzantine period.

However, the Classical settlement record for southern Jordan has been heavily criticised by scholars for its supposed incomplete dataset (Freeman 2001, 439). Schick (1994), in a review of the archaeological and textual evidence for Byzantine southern Jordan, questions totally the value of survey projects for historical reconstruction. Certainly characterisations of the settlement record are quite broadly drawn. Moreover, as Fiema's (2002b) recent overview of the hinterland of Petra and Watson's (2001) synthesis of archaeological evidence for Byzantine Jordan make clear, much of the dataset rests on interim publications. Watson's (2001, 466–474) picture of settlement change in southern Jordan contrasts a densely populated Nabataean/Early Roman population with a decline in the later Byzantine period. However, this picture is rarely based on quantitatively produced survey data (Banning 1996). Graf's (2001 see Figure 117, page 446) recent analysis of the Roman countryside of *Arabia* was based on raw site counts by ceramic period and showed a marked decline in Roman and Byzantine sites for southern Jordan. Finkelstein (1998, 123), in a review of three major surveys in southern Jordan (the Hesban survey, the Kerak Plateau Survey and the Wadi Hasa Survey), noted that that the quantification of raw site numbers was the only data that could be usefully presented to demonstrate settlement change.

This lack of quantifiable data severely hinders research into the nature of settlement patterns in southern Jordan. Within the context of resource control, the lack of settlement characterisation obscures the relationship of forts with the wider socio-economic system. Does military variation correlate with settlement patterns as Fiema suggested? Or, as Young

or Lintott would suggest, did the government have minimal involvement within the wider economic system? The main aim of this chapter is to test Fiema's hypothesis that military sites and long-distance trade had a direct correlation, as he had shown through spatial and temporal settlement fluctuation (Fiema 1991, 1995).

The data used to analyse settlement variability will come from three sources: number of sites observed, continuity in site occupation and the function (or nature) of each site. Site sizes will not be analysed here as most projects do not record total site size but confine themselves to a measurement of the salient architectural features. Also, site distribution patterns will not be analysed as all the projects reviewed in this chapter were prospection type surveys or, in the case of the DAS, looking for spatial structure. Thus any patterns on a regional scale will only serve to demonstrate surveyors field coverage rather than ancient settlement patterns.

Initial tabulation of the dataset through number of sites by period can establish broad patterns of long-term settlement activity. When these patterns are correlated with other surveys they can serve as a quick characterisation of settlement patterns through time. Continuity in site occupation can be used to infer some degree of strength in the landscape. The assumption is that continuity in occupation, observed through the presence of ceramics occurring in each subsequent period, denotes some measure of stability in the economic and landholding patterns. Alternatively, low rates of continuity or sudden surges in new sites can mean disruption in landholding patterns and a weak or fluctuating economy.

As noted in Chapter 5, the function of each site is mostly determined by the architectural plan. This holds for most Classical period sites investigated in Jordan. In the DAS project, nine divisions of site type were interpreted on the basis of architectural plans: Structure(s), Settlement, Tower, Farmsteads, Fort, Road Station, *Caravanserai*, Religious structures and twentieth-century structures. These are assumed to display some normative relationship with general trends in the socio-economic and political landscape. The last two site types produced only a few sites with datable sherds and have not been included in the following analysis. Forts, Road Station and *Caravanserai* were grouped together under the general term "State". Thus the analysis of built structures comprises five site types: Structure, Tower, Farm, Settlement and State. There are problems comparing site type from the DAS project with those of the other four surveys analysed here. These problems and ceramic limitations are discussed in the following sections on each survey project.

## Dana Archaeological Survey

### Introduction

This first section will present the process whereby the DAS field data was used for analysis of continuity and site type patterns. Next, the total chronological sequence of sites is analysed, followed by a section giving a more in-depth analysis of the Classical period.

The site type data for this section has been extracted from the Site Gazetteer (Appendix 1). The ceramic evidence was taken from data in Appendix 3. Both sets of data were combined in an Access Database and queries were established correlating site type, ceramic date and geographical divisions of the DAS project universe. There are five divisions, as outlined in Chapter 5, that follow distinct areas. These are the Jibal, Shaubak, Desert, Arabah and Ma'an (see Figure 2, page 316). The resultant data from these queries is presented in tabular format in Appendix 4, DAS Tables 1–40.

The data presented in this chapter is also in a tabular format. The table headings and format are for the most part self-explanatory. However, in the tables presenting data for site continuity one should note the following headings. "No. of sites" is merely the total number of sites having ceramic identification for that period. The "% of sites" is merely the percentage of the specific period total expressed as the division of the sum of all periods. "Continuity of sites" refers to the number of sites from that row's period that continues with a ceramic identification in the following period. The "% of continuity" is expressed in the same manner as the "% of sites" column. This system is followed in all DAS and other survey tables throughout this chapter. Thus a continuity figure of 60% means that 40% is new. However, this does not mean that the site is a pristine formation. In fact, the site may be reoccupied.

### Summary of results

Of the 408 sites noted in the survey, 252 contained datable ceramics. However, of 244 structural sites, 190 have datable ceramics. Table 31 (page 448) provides a tabulated overview of all sites encountered in the DAS area. It clearly demonstrates the high ratio of Classical sites to other periods – 64% of the total number of sites within the DAS project area. However, within that period it is clear that most were occupied in the Roman and Byzantine periods. A decrease in sites during the Early Islamic period is particularly noticeable. Similar levels seem to have been maintained during the Middle Islamic period but there is a decline during the Late Islamic period. However, one should note that the Late Islamic figures do not represent the full picture of settlement density. Many modern

settlements have a nineteenth-century origin that was not factored into this tabulation as these results are based on ceramic evidence only.

The most noteworthy results in the continuity section of the table are the high continuity figures for the Nabataean to Roman and Roman to Byzantine periods. It is not surprising that the highest site numbers are recorded within this period, but the continuity figures are more impressive when one notes that over 90% of these sites were reoccupied in the preceding period. Of note is the high number of Iron Age sites continuing into the Nabataean Period. While there has been considerable debate regarding the transition from the Iron Age to Nabataean period (Bartlett 1989; Hart 1986b, 1987), there are no proven connections between the two periods. Thus a 76% continuity figure is noteworthy especially when compared with the lower figures in the Islamic periods of 49% or 56%. While this transitional period is not part of this study, it should be borne in mind when discussing the antiquity of the landscape that the Romans annexed in AD 106. Perhaps many of the Nabataean features of the landscape had an earlier root in the Iron Age settlement pattern.

However, the transition to the Early Islamic period is not as drastic as earlier surveyors noted, as many traditions certainly continued up until the ninth/tenth centuries (Walmsley *et al* 1999, Walmsley & Grey 2001). However, the 43% of sites that continued into the Early Islamic period still suggests that there seems to have been a distinct shift in land patterns from the Byzantine period. While a decline of population density is not unreasonable given the historically attested plagues and the 30-year rule of the Sassanids, there seems to be little evidence of land redistribution or reallocation in the historical record following the Islamic conquest (Kaegi 1992, 1996). However, the DAS data suggests a distinct break or shift in landholding patterns where over 50% of sites appearing during the Early Islamic period are new. This does not mean they are pristine sites but that there was no occupation in the preceding Byzantine period. Thus there seems to be a clear break in landholding patterns.

These overall figures can be broken down into the five geographical areas outlined above: Jibal, Shaubak, Desert, Arabah and Ma'an. These are tabulated in Table 32 (page 448). They are expressed as a percentage of the total number of sites in an area and have been collated from Appendix 5 DAS Tables 1–5. As prehistoric sherds were only found in the Shaubak area, there will be no further discussion of this period. However, one should note that percentage continuity of Iron Age to Nabataean sites is impressive in the four main areas. In the Classical period, the same pattern is repeated across the four areas with continuity at its highest in the Nabataean to Roman period. It then declines slowly until there is a distinct change during the Byzantine to Early Islamic period. There is a 10% rise in continuity from

the Early to Middle Islamic period but this increases substantially from the Middle to Late Islamic period.

## Classical period

### Introduction

This section will deal with the Nabataean, Roman and Byzantine periods. The Roman and Byzantine periods can each be broken down into two sub-periods (*e.g.* Early and Late). This was not attempted for the Nabataean period, as the main historical focus of the study is the Roman and Byzantine occupation. Other projects (*e.g.* Parker 1986a), mostly using Sauer's Hesban chronological divisions, further divide these Early and Late divisions into three sub-divisions each. This was discussed in Chapter 2 where such apparently fine distinctions have created a spurious accuracy which some have used to over-correlate with historical events. For reasons outlined in Chapter 5, DAS opted to focus on the two, admittedly crude, divisions of each period – Early and Late.

### Results

The total figures for all sites are tabulated in Table 33 (page 448). These figures show the rise in the number of sites from the Nabataean period of 136 to a high in the Late Roman period of 159. There is a slight decline in the succeeding Early Byzantine period but the numbers drop in the Late Byzantine period. However, even this lower figure is still equal to the number of sites in the Nabataean period. The continuity figures again demonstrate the stability of settlement during this period and it is clear that there was little change in settlement stability during the incorporation of the Nabataean Kingdom into the Empire.

The above figures can be further sub-divided by the five geographical areas used above. This is tabulated in Table 34 (page 448), which has been derived from Appendix 5 DAS Tables 6–10. The patterns for Shaubak and Jibal are fairly similar, apart from a drop in continuity in Shaubak from the Early to Late Byzantine period and a higher figure for the Late Byzantine to Early Islamic period. However, as the Arabah and Desert areas show a different pattern in the Late Roman to the Late Byzantine period, this suggests that there is a separate settlement pattern occurring outside the Jibal and Shaubak areas. As the field survey of the Desert and Arabah areas focussed on communication routes, this may be related to a methodological process. Certainly, sites in the Desert and Arabah areas continued further into the Late Byzantine period compared with sites in Shaubak and Jibal. The high continuity figures for Ma'an merely highlight the integrated nature of the agricultural complex which is fully described and analysed in Chapter 8.

## Division of sites into structural types

### Introduction

The following section will correlate ceramic date with site morphology. In Chapter 5 site morphology and interpretation were discussed and the various types of sites outlined. Using a variety of contextual arguments the sites were divided into various interpretative and descriptive groups. As was noted in Chapter 5, 60% of sites were classed as built structures that would be used by humans in a variety of occupation functions. The rest were roads, or agricultural and livestock features. Within this 60% of built structures, nine sub-divisions of site type were made: Structure(s), Settlement, Tower, Farmsteads, Fort, Road Station, *Caravanserai*, Religious structures and twentieth-century structures. The last two site types produced only a few sites with datable sherds and have not been included in the following analysis. Forts, Road Stations and *Caravanserai* were grouped together under the general term "State". Thus the analysis of built structures comprises five site types: Structure, Tower, Farm, Settlement and State. These types were then matched against the ceramic dates in an Access Database using the same procedure as noted above. The correlation of ceramic data with the site types was not done for the Ma'an complex as the function and time-span of this unitary structure are already understood.

### Summary of results: Classical period

Out of 244 structural sites, only 190 can be dated and the breakdown by type is presented in Table 35 (page 449). There will be some disparity between the number of site types presented in Chapter 5 and those listed here. In some cases multiple type interpretations were listed for sites in Chapter 5. This has been simplified in the overall figures for this chapter. As is immediately apparent, single structures account for 37% of the total number of site types. However, only 65% of single structures have ceramic dates – much less than other types. This, along with the fact that no secure functional base can be found for these structures, makes it hard to analyse their overall significance.

The second most prolific site type is Settlement, accounting for 23% of the total. Tower and Farmsteads come next, accounting for 17% and 13% respectively, whilst State sites account for only 10% of the total. However, between 83% and 93% of these sites have ceramic dates. If one analyses these types across the five areas, several features are immediately obvious. These are tabulated in Table 36 (page 449). Clearly, Settlements and Farms are prevalent in the Jibal and Shaubak areas. This is no surprise as both areas are within a Mediterranean

environment with a rainfall of over 25 centimetres a year. Moreover, the geology of the area means that abundant springs are located along the Plateau edge.

When all Structural sites are correlated against ceramic dates, several patterns are clear. These are tabulated in Table 37 (page 449), which has been compiled from the tables in Appendix 5, DAS Tables 10–14. One can see instantly from the table that continuity rates for the Classical period are very high across the whole area. Again, the same break in settlement pattern is observed in the Late Byzantine to Early Islamic period, where continuity across-most categories drops to around 30/40%. However, settlement continuity is 74%. This is highly significant as previous observations of survey data always posit a drop across all levels of society. While there is a clear drop in continuity from the Early to Late Byzantine period, it is not as pronounced as the 30/40% figure.

When this data is broken down by area similar patterns are again observed. The Jibal and Shaubak areas will be treated first as they both exhibit similar patterns. These are tabulated in Table 38 (page 450; taken from Appendix 5, DAS Tables 20–24) and Table 39 (page 450; taken from Appendix 5 DAS Tables 15–19). In both Jibal and Shaubak, Settlement continuity from the Late Byzantine to the Early Islamic period is 78% while the other type categories are clearly lower. However, in the Shaubak area, Structure, Tower and Farm levels are around 25% higher than in Jibal, which suggests that the wider agricultural landscape did not suffer as much there.

In contrast, the Arabah and Desert areas exhibit variant readings. These are presented in Table 40 (page 450; taken from Appendix 5, DAS Tables 25–29) and Table 41 (page 450, taken from Appendix 5, DAS Tables 30–34). These readings may be due more to the small sample size as no Farm sites were encountered in the Arabah and no Farms or Settlements were noted in the Desert. This is an obvious feature of the environment, although other surveys have noted sites in the Arabah. The variants are probably due to the different field methods used by DAS, where the emphasis was on communication routes. Thus, small side wadis in the Arabah were not fully surveyed, but strong continuity of State and Tower sites associated with communication routes is shown. The poor continuity of Single Structure sites is probably related to the arid environment, as such sites did not have the resources to harvest water on the scale of State sites. The State sites in the Desert area show a strong sense of continuity even into the Early Islamic period, which relates to the strength of traffic along the pilgrimage route that became known as the Darb El Hajj (along the route of the modern Desert Highway).

### Discussion

The overwhelming evidence from the DAS project demonstrates high levels of settlement throughout the Classical period. Specifically, the rate of site continuity is extremely high, suggesting little breakdown in economic patterns as suggested by Fiema and others. Overall, the sense of strong continuity since the Iron Age to the end of the Byzantine period is striking. There are some regional differences between the Wadi Arabah and the Plateau area but this may be due more to environmental factors. The higher continuity into the Islamic period in the Shaubak area compared with the Jibal hints at some difference in landholding patterns. Indeed the much higher rate of continuity into the Islamic period of Settlement sites is quite marked and does not point to an overall collapse of the settlement system usually posited at the end of the Byzantine period. It is clear that Farms and Towers were much more a part of a specialised Classical landscape. Both these types correlated much more with State sites. Thus State sites demonstrate a partial correlation with the overall settlement pattern.

## Comparison with four surveys

### Introduction

This section will critically review and analyse the data from the four projects that had quantitative data suitable for comparison. These are: the Wadi Hasa Survey; The Southern Ghors and North Arabah Survey; The Kerak Plateau Survey and the Limes Arabicus Survey. This is the first time that all this data has been collated and analysed for the Classical period in southern Jordan. There are problems with the correlation of such a large and diverse datset. Initially there is the problem of rationalising data because of the different research strategies and field methods used. It is hoped to alleviate this problem by a critical review of each project's research strategy, outlining any potential bias in the data. The problem of ceramic identification and site type definition will also be addressed. The data for each project was extracted from the main publication reports and entered into an Access Database. The results of this analysis are presented in Appendix 5, Tables 41–64. The analysis of this is summarised in tabular format within each project review. The format of the tables follows the DAS section above.

## Wadi Hasa Survey (WHS)

WHS was one of the first major surveys in southern Jordan to be undertaken since the large-scale prospection surveys of Glueck in the 1930s. It was intended to provide a preliminary settlement history of the area and test Glueck's ideas of settlement change on the Edomite Plateau. MacDonald carried out three, roughly six-week long field seasons of survey in

1979, 1981 and 1982. The survey area stretched along the southern banks of the Wadi Hasa on the Jordanian Plateau and roughly ran east-west from the Turkish fort, Qal'at Al Hasa, to the modern road that skirts the edge of the Plateau overlooking the Wadi Arabah (Figure 119, page 451). The main results are published in a final report (MacDonald 1988) although this was preceded by a number of preliminary reports (MacDonald *et al* 1980; MacDonald *et al* 1982 & MacDonald *et al* 1983). For the Classical period there were also several interpretative articles by MacDonald and other team members (MacDonald 1984a & 1984b; Roller 1983; Banning 1986). However the following treatment of the project and the data used has been taken from the 1988 final report. This review will not deal with prehistoric periods of this project.

The research strategy primarily intended to provide a chronological sequence of settlement patterns in the area down to the end of WW1. It was not designed as a problem-orientated research programme. However, a prime consideration was the demonstration, or not, of Glueck's view of settlement change from the Early Bronze Age to the Islamic period (MacDonald 1988, 4–9). While the WHS results were different from Glueck's, it must be noted that the difference was one mainly of scale. Glueck's demonstration of a large-scale Early Bronze Age settlement pattern, followed by decline until an efflorescence in the Iron Age, then an apparent break until the dense Nabataean and Classical periods, and with subsequent decline during the Islamic period, was not markedly different from the conclusions arrived at by MacDonald (MacDonald 1988, 290–295). Some specific factors, such as Glueck's contention of an Iron Age defensive network along the southern bank of the Wadi Hasa (reflecting the borders of the Biblical kingdom of Edom), were heavily questioned by the WHS (MacDonald 1988, 188–189).

Although areas of the survey universe were covered using pedestrian transects, allowing a probabilistic analysis of the figures, no such analysis appears in the final report. Similarly, while there are two chapters (3 & 4) dealing with the geology and natural resources of the area, the data in these chapters was not systematically integrated with the overall settlement pattern. In short, while the WHS project provides a large amount of data at regional level (and appears in wider synthetic works as indicative of Jordan, see Alcock 1993), the interpretation of settlement change and process is rudimentary.

The bulk of the final report is made up of a descriptive list of sites collated by ceramic period. The site inventory contained in Appendix 1 only lists site type and location. Thus the full range of ceramics and site descriptions are contained within the bulk of the main chapters. As there are few single period sites, site description and sequences are arranged

across several chapters. No attempt was made to provide fully cross-referenced tables across periods and no sense of site continuity was attempted other than to give a general appreciation of broad tallies. In fact, the main tools for assessing settlement patterns across time are the 12 site distribution maps dotted throughout the main period chapters (Figs. 38, 43, 47, 48, 51, 52, 57, 60, 62, 63, 65, 66). The main analysis is done by viewing geographical variations through time. While there is nothing inherently wrong with this approach (however, it must be noted that MacDonald's periods are confusing and will be discussed below), the results should be predicated on a properly constituted sampling procedure, or the distribution maps will merely reflect the field survey activity only. In this case, although Banning had carried out a full pedestrian survey of the central universe of the project, it was neither applied to other areas, nor integrated into the overall distribution maps in the final report. Thus, MacDonald's maps (and hence analysis) lack a secure logical foundation.

The field methods used were summarised by Banning in MacDonald's Chapter 2. The methods employed in WHS fall within an American tradition of survey projects that concentrates on the sampling decisions made in the research strategy. What is questionable about this approach is the validity of site definitions. Banning outlines what constitutes a site in the WHS: "All scatters of sherds or artifacts, and all architectural remains, which appeared to date earlier than AD 1918" (MacDonald 1988, 15). Within this wide definition there seems to be no attempt, in the methodology chapter, to provide a clear process for the interpretation of site function. That is to say, while the list of sites in Appendix 1 contains precise site definitions (*e.g.* Farm, Tower, Fort, Tomb etc.) no method is given to explain how these definitions were arrived at. This is not to deny the undoubted experience of the surveyors in reading the landscape and its sites, but this vital part of site survey should be more explicit. Failure to do this means that the project's analysis rests on untested commonsensical assumptions.

As the prime function of collecting artefact samples was to provide dates for occupational periods only diagnostic sherds were collected in a purposive manner. Banning deals briefly with the consequences of using this type of data but only with the impact on the inferences drawn from this particular form of sampling (*e.g.* no statistical analysis can be attempted) (MacDonald 1988, 24–25). Conspicuously missing from the methodology chapter is an appreciation of the procedure for inferring a chronological date from the ceramics. There is no discussion of the literature used to provide a chronological framework. Examples of diagnostic ceramics for each period are contained within Plates 1 to 23 (pages 302–347) and are usually listed with a specific published parallel. A list of the archaeological periods used

in the text is given on page viii but this is the standard chronology defined by Homès-Fredericq & Hennessy (1986). However, MacDonald's omission of a detailed treatment of the ceramic data severely undermines the overall validity of his project and has been criticised as such by others (Finkelstein 1998; Routledge 1996). Therefore, aside from reclassifying his Early Roman dates as Nabataean to correlate with the DAS data (which has been done for all of these American projects), it is impossible to interrogate the ceramic framework further. Thus, one can only accept his ceramic dates as they stand.

The ceramic data for the analysis of the WHS was taken from MacDonald 1988, Tables 21–69. Each table contained the Site no., Sample no., No. of sherds and the Plate no. for illustration. In Appendix 1 (*ibid.* 1988, 364–387) there was a list of sites with type of site, co-ordinates, elevation and inventory rating. In this study, data from both these sources was entered into a relationship database, bar the co-ordinates, elevation and inventory rating. As there was no central list of samples, it was difficult to cross-check the individual entries as site and sample numbers were spread throughout the 48 tables. As noted above, the presentation of data was arranged by chronological order across 41 periods from Neolithic to Late Ottoman/Modern. However, to allow cross-project comparison, they were grouped into 10 major periods that followed the main DAS units and the method is listed in Appendix 4. The data was then subjected to the procedure noted for the DAS examples above, where type was matched against ceramic date. From a total of 1074 listed sites, 478 produced ceramics that can be dated. 246 sites were classed as Structural remains, as defined by DAS for this study, of which 186 produced ceramic dates.

### WHS results

The results of all the WHS sites are tabulated in Table 42 (page 452). They show that during the Nabataean, Roman and Byzantine periods the number of sites was higher than in all other periods bar the Late Islamic period. However, the continuity rates are very low, ranging from 26% in the Nabataean to the Early Roman period, to 16% from the Early Roman to Byzantine period, and then 6% in the Byzantine to Early Islamic period. In contrast, 65% of Iron Age sites showed continued occupation in the Nabataean period. As noted above, MacDonald did not assign the distinctive fine Nabataean ware to the post-annexation period. At the time of the project the fact that such wares were in existence until the fifth century was not understood (Fiema 1995). Thus, many sites assigned to the Nabataean period may also have had Roman occupation.

However, this does not explain the very low continuity rates during the Classical period. It seems clear that a drop occurs during the Byzantine period to the Early Islamic period but it

is not as distinctive as the DAS data suggests. More importantly, MacDonald claimed that Early Islamic evidence is virtually "absent" (MacDonald 1988, 295) from the survey area. His figures were subsequently used by other scholars to show the dramatic drop in sites from the Byzantine period and the collapse of the Classical system (Fiema 1991). However, even MacDonald's low figure of 6% continuity from the Byzantine period to the Early Islamic period is not that dramatic when compared to the continuity levels of 26% and 16% in the preceding Nabataean and Roman periods. The dramatic drop-off is, in fact, in the number of sites (126 in the Byzantine to 11 in the Early Islamic). Nevertheless, during the Classical period there were many sites but with relatively low levels of continuity. The very high number of Late Islamic sites are striking, as is the high continuity level of 92% of sites from the Middle Islamic period. This is partly due to a greater ignorance of the longevity of Islamic wares, and because dating bands are wider than those used to define the Classical periods.

If one only includes sites that contained structural remains then slightly higher continuity figures are achieved. This is tabulated in Table 43 (page 452). Within this sample there were 246 structures of which 186 produced ceramic dates. As one can see, the continuity rates for the Classical period are lower than for all the other sites. On the face of it, MacDonald's figures seem to demonstrate higher continuity for all periods other than the Classical period. This is partly due to the significantly lower number of sites in the non-Classical periods, which may affect the percentage figures. It may also be partly due to the over-correlation of ceramic typologies for the Classical period, which are less restrictive in other periods. Nevertheless, MacDonald's figures seem to suggest more fluctuation in the Classical period site patterns.

The breakdown of the different structural site types in the WHS area is presented in Table 44 (page 452). The table is divided into seven types: State, Structure, Farm, Mill, Temple, Tower and Settlement. Of these, Mill and Temple will not be discussed as these sites are not encountered across all the other project areas. The table clearly shows that Settlement and Farm sites predominate, which is not surprising in such an agricultural area. However, Tower sites clearly form a major part of this landscape. State sites form a much lower ratio but this is similar to the DAS figure of 10%.

The ceramic correlation of the different structural types is achieved in Table 45 (page 452). The data for this table is taken from tables WHS 40–44 in Appendix 5. It is clear that across all site types it was during the Iron Age and Classical periods that the highest levels of continuity were achieved. The complete absence of continuity during the Byzantine to Early

Islamic period of Farm, Tower and Structure sites is striking. As noted above, there may be certain methodological reasons for this. However, the higher level of continuity for Settlement sites during all periods is striking. This reflects similar findings in the DAS where this was the one type of site to continue strongly after the Byzantine period. It is noteworthy that State sites achieved a higher continuity figure compared to Tower, Farm and Structure sites during the Classical period.

### Discussion

The WHS readings are quite varied and the overall rates of continuity are very low. This would give the impression of a highly fluctuating economy of changing landholding patterns. As Fiema based much of his PhD work on the Wadi Hasa Survey, it is not surprising that he concluded there was a clear economic downturn in the Byzantine period. However, MacDonald used Nabataean pottery as a period marker with the Roman period. This had the effect of making the Nabataean period site ratios seem much higher than later periods'. Although Fiema (1995) later recognised this feature of MacDonald's ceramic analysis, this did not substantially alter his views of a Byzantine economic downturn. Nevertheiess, it is clear that Settlements show much higher continuity than other forms into the Islamic period, which matches the DAS data. However, MacDonald's dataset and his method of ceramic analysis make any further analysis difficult.

## Southern Ghors and North Arabah Survey (SGNAS)

The SGNAS project was undertaken by MacDonald to complement his Wadi Hasa Survey and provide a contrast with the semi-arid environment of the Wadi Arabah and the Mediterranean landscape of the Jordanian Plateau. The field survey was carried out during two seasons in 1985 and in 1986. This was reported in several preliminary publications (MacDonald & Koucky 1986; MacDonald 1987; MacDonald *et al* 1988). The final report was published in 1992 (MacDonald 1992). The project area extends from the modern town of Al Safi at the southern edge of the Dead Sea to the Wadi Fidan 55km to the south, which is a continuation of the Wadi Faynan (Figure 120, page 453).

As with the WHS project, MacDonald's research aims were very broad. Initially he wanted to compare data from the Wadi Arabah with data from his WHS on the Plateau. This was to test the strength of the relationship between these two areas, as earlier explorers had noted the degree of transhumance in the nineteenth century. In addition, he wanted to prospect for prehistoric sites in hitherto unexplored areas such as the Lisan peninsula. Also, he wanted to investigate if there was a dearth of Bronze Age sites in the Wadi Arabah which would reflect

the WHS results. He also wanted to investigate the relationship of Edomite sites on the Plateau and Iron Age sites in the Wadi Arabah, and to locate sites in the Wadi Arabah known from textual sources to see if there was a line of Roman sites denoting a road (MacDonald 1992, 4).

However, his conclusions (*ibid.* 157–161) are broad and relate only to a general rise and fall of settlement, and give a minimal interpretation of the processes behind these patterns. This is not helped by his main discussions of sites by period, which, when allied to a narrative description of site location and plan, make for a somewhat unclear report. The specific questions that he posed at the beginning of the report are only cursorily answered. Furthermore, although he divided his survey universe into five environmental regions (*ibid.* 10–11), he did not correlate these with his findings. This failure echoes the WHS, where there was also poor integration of environmental data with archaeological data.

MacDonald employed similar field methods to his earlier WHS project (see above). He claims to have used pedestrian transects which could be used for probabilistic analysis (MacDonald 1992, 9 & 12, Table 3) as was sketched out in Banning's discussion of the WHS material (MacDonald 1988, 18–20). However, no such analysis or awareness appears in subsequent discussions of the sites by period. His main sources of information were through purposive vehicular or pedestrian survey based upon a previous literature survey, aerial photographs or on information from local inhabitants. His survey universe was divided into five land-use/environmental regions: 1) agricultural land; 2) gravels and colluvium; 3) sandy areas; 4) piedmont; and 5) wadi beds and ridges. MacDonald describes the results of this in his introduction (MacDonald 1992, 10–11), but no further elucidation of site type was cross-referenced with the five regions in the site chapter discussions. His site definition remained the same as that used in the WHS: "all scatters of sherds or artifacts, and all architectural remains, which appeared to date earlier than A.D. 1918" (*ibid.* 9). However, he excludes field clearances, stone field walls/terraces but includes caves/animal pens if sherds or lithics are noted. There is no further discussion of how this site definition may impact on specific site interpretations of use etc. Further, although frequent site interpretations (*e.g.* farms, enclosures, tombs etc.) are noted in the list of sites in Appendix 1 and throughout the chapters, there is no discussion of how these functional interpretations have been achieved.

The collection of artefacts from sites was designed primarily for dating and, although MacDonald notes (*ibid.* 130) that types of activity could be ascertained from artefacts, this was not systematically carried out. The project collected all artefacts types. The collection procedure seems to have varied depending on site type and location, ranging from purposive

area samples to transects across sites. There seems to have been no standardised sample square for the transect collections. Furthermore, the decision to separate sample areas in a site was dependent on an intuitive visual appreciation rather than on the basis of qualitative measures. Thus, while MacDonald made some adjustments in his survey methods to use a quantitative or probabilistic approach, it was insufficient to quantify fully his survey methods and analysis. In effect, MacDonald's SGNAS survey can only be used on the same level as a fully purposive survey that collects only diagnostic sherds in a random manner.

It is highly unfortunate that MacDonald did not, in any way, describe or discuss his procedure for "reading" the ceramic dates for his sherd collections. Neely, in his discussion of the lithic samples, does outline some problems of lithic identification and attribution (*ibid.* 23–24), but this critical awareness does not continue in the treatment of the "ceramic " periods in the later chapters. As has been outlined in Chapter 5, the chronological parameters of southern Jordanian ceramics are as yet not fully understood, and MacDonald's lack of discussion of the problems and issues is striking. The ceramic evidence, as such, is presented in a series of plates (MacDonald 1992, Plates 6–35, pages 184–241) with sectioned illustrations, brief ware descriptions and literature parallels. These ceramic attributions seem only to match that illustrated piece and the connection with the tabulated tables of sherd identifications is unclear except when cross-referenced to a specific illustrated example. MacDonald acknowledges the contribution towards sherd identifications of K.'Amr and D.S. Whitcomb who appear as contributors to the volume. He also notes the initial help of Z. Kafafi, N. Khairy, N. Lapp, M. Piccirillo and F. Zayadine (MacDonald 1992, 6). These archaeologists have all worked in various parts of Jordan and Palestine and the reconciliation of their own work stemming from quite varied ceramic traditions and chronologies is not always straightforward.

At a broad level, there was no critical comment on the divisions between southern Jordanian ceramic traditions and the northern Palestinian/Jordanian ones. As 'Amr carried out the bulk of the Classical dating, it would be logical to assume that she based part of her identifications on her work in the Petra region (*e.g.* 'Amr 1991). However, this is not discussed and the whole problem is summed up in a few lines: "The local pottery traditions are not as well known in the south as they are in the north of Jordan. 'Amr searched for pottery parallels that were geographically close to the survey territory. However, often she had to look further afield for parallels" (MacDonald 1992, 6). It must be noted that in the pottery analysis of the WHS project, MacDonald clearly used the northern Hesban sequence of ceramic levels developed by Sauer. 'Amr, on the other hand, had carried out most of her work in the Petra

region. The combination of these two working traditions is never discussed. This is especially unfortunate as MacDonald attempted to compare the two projects in his conclusions (MacDonald 1992, 159–160) but did not cover this basic problem.

The data used in this study was taken from MacDonald 1992. MacDonald followed closely the methodology developed in the WHS and the layout of material is the same as his 1988 publication. He divided his ceramic samples into 29 periods (*ibid.* 7), the results of which are listed in Tables 22–62, which followed the same layout as his WHS tables. In addition, in Appendix One (*ibid.* 249–274) he listed site number with co-ordinates, elevations, inventory listing, general dating and description (which contained the site type). Again, the primary analysis done by MacDonald was through the tables with the attendant maps.

For this study, the data was extracted from the sources noted above to construct a relationship database. Thus, site number, site type and ceramic dates were entered. Of the 29 periods used by MacDonald, the Neolithic period was not used in the present study as it was outside the chronological parameters of the study. The Late Islamic period could not be used due to a processing error in this study. These periods, listed in Appendix 4, were grouped together in this study into seven major periods from prehistoric to Middle Islamic for cross project comparison. The method for this is listed in Appendix 4. Of the 240 sites surveyed, 148 produced ceramic dating. In addition, only 32 sites had upstanding structures, following the DAS definition, of which 29 produced dating.

### SGNAS results

The results of the whole SGNAS survey are presented in Table 46 (page 454). The SGNAS sample of sites is noteworthy as over a quarter of the sites recorded were within the prehistoric period. Overall, the results show higher continuity figures than the WHS. Also, most of the Classical sites were within the Byzantine period (22%). Continuity through the Classical period varied between 44% and 47%, while only 19% of Iron Age sites continued into the later Nabataean period, which is significantly lower than in the WHS areas. The steady continuity rates in the Classical period may be due to the choice of ceramicist for this project. As noted above, 'Amr probably used the Petra ceramic sequences more than the Sauer Hesban sequence used by MacDonald 10 years earlier (although the lack of detailed ceramic method statement makes this difficult to confirm). However, as SGNAS was wholly located within the semi-arid areas of the Wadi Arabah, there may be specific environmental factors for this result. Again there is the clear dip in continuity from the Byzantine to Early Islamic period but this picks up in the transition to the Middle Islamic period where the figure is 86%.

Similar trends are noted when one looks at Structural sites only. Within this sample of 32 sites, 29 produced ceramic dates. These are presented in Table 47 (page 454). Again the Classical period produced the most sites, with the Byzantine period comprising 25% of the sample. However, the continuity figures for the Classical period are significantly higher, with the Nabataean and Roman figures between 70% and 60% respectively. This highlights the drop in site continuity between the Byzantine and Early Islamic period at 22%, which is only slightly higher than the 18% of the previous table. Thus, as with the DAS, the trend is emphasised in this table as the Classical period represents a highpoint in site numbers and strength of continuity

The structural sites can be broken down into seven groups, which are presented in Table 48 (page 454). The sample can be divided into State, Farm, Mill, Structure, Temple, Tower and Settlement. As in the WHS project, both Mill and Temple were not used in this analysis. This sample only includes 32 sites, of which 29 produced ceramic dates. The table mirrors the DAS and WHS figures where Settlement and Structure remain the dominant types. No doubt reflecting the environment, Farms are not well represented and are the lowest type at 11%. The sample of State sites is relatively high, which reflects the importance of the Wadi Arabah communication routes.

When these structural sites are correlated against ceramic dates and levels of continuity a high level of state control is evident. This data is presented in Table 49 (page 454), which has been taken from Tables SGNAS 45–49 in Appendix 5. However, as SGNAS had a relatively small number of sites within this sample, the percentage figures look impressive with frequent 100% entries. Nevertheless, it is clear that Tower and State sites have strong continuity, which reflects a landscape of control and security. The other three types – Structure, Farm and Settlement – have poor continuity figures.

### Discussion

The analysis of SGNAS data produced quite different readings to the WHS. There is a stronger rate of continuity in all sites, especially in the Byzantine period. This would seem to match the DAS data from the area. However, these higher rates of site continuity are due to more to the better knowledge of the ceramic analyst on the project, K. 'Amr. Nevertheless, the SGNAS data points to a more stable economic system than the WHS data. In this regard, State correlation is strong but, like the DAS data, only partially correlates with the overall settlement pattern.

## Kerak Plateau Survey

The Kerak Plateau Survey was undertaken by Miller and Pinkerton during three, roughly seven-week field seasons in 1978, 1979 and 1982. The aim of the project was to develop a complete gazetteer of archaeological sites on the Kerak Plateau. The project covered a massive area, known as Moab in the Bible, between the Wadi Mujib in the north to the Wadi Hasa in the south (Figure 121, page 455). The project was reported in several preliminary publications (Miller 1979a, 1979b, 1982) and the final report appeared in 1991 (Miller 1991).

The aims of the project were twofold. First, to collect all previous archaeological data and accumulate new data through field survey. Second, to sample all the sites for ceramic artefacts for dating purposes and to provide a ceramic chronology of the area (Miller 1991, 18–19). The first task involved a major literature search with a thorough updating of site names, locations etc. As part of this, Knauf provided a toponymic survey of the area (Knauf 1991, 281–290). However, the major component of this phase was three seasons of purposive field survey that aimed to record all major upstanding remains. During this phase, purposive diagnostic ceramic samples were taken from most sites. If the aims of this survey seem more modest compared to modern surveys it should be apparent that previous archaeological exploration had been slight and the results published in more obscure publications (Miller 1991, 14–17). Thus, the final publication is more a gazetteer and reference work than an analytical piece of research. Therefore Miller provides no analysis of settlement hierarchy, density or change.

There seems to have been no operational definition of what constitutes a site. Miller provides a list of features that he considers a site (Miller 1991, 26): cairns, partitioned cairns, stone heap, building ruin, khirbeh (Arabic for substantial ruin), settlement site, wall lines, enclosure. As one can see, interpretative, local and descriptive terms are used to designate what is, in effect, upstanding architecture, although one should also note wall lines, which may be field boundaries. No attempt was made to record artefact scatters. In the gazetteer (Miller 1991, 23–168), further terms are elaborated upon, *e.g.* farms, towers, etc. The terms are presented as commonsensical interpretations with no discussion. The field survey methods appear to be totally purposive. In addition, the surface collections of sherds were purposive. Miller provided a short discussion of why no random grid sampling was carried out (Miller 1991, 20) – mainly for the practical reason of needing to cover a large area in a short time.

As the basis for ceramic collection was to provide chronological variation, the sampling process was biased towards the recovery of diagnostic sherds. Brown studied the ceramics and provided a full description with brief period introductions in Chapter III of the main publication (Brown 1991, 169–279). It must be noted that along with Parker's description of the Limes Arabicus corpus, Brown's discussion of the ceramic wares is the most complete. While the overall nature of the southern Jordanian ceramic framework has been discussed in Chapter 5, it worth noting that Brown's ceramic dating methods followed the Hesban tradition developed by Sauer. In fact, Brown served in the 1979 season of the project (Brown 1991, 169) and is a specialist in Islamic wares stemming from her own work at Islamic sites in the area (Brown 1987, 1988, 1989, 1992). In contrast to the WHS and SGNAS, Brown acknowledged the difficulty of using a ceramic chronology in this area and provided a summary of the caveats involved (Brown 1991, 170). The main concern was the general lack of literature parallels for the area and therefore the need to refer to more distant regions.

The data used in this study was taken from Miller's 1991 publication. This was derived from a combination of the site descriptions given in the main gazetteer (Miller 1991, 29–167) and the list of sites by period on the basis of ceramic samples (*ibid.* 307–319). The site descriptions contained the site number, name, and co-ordinates, with a relatively lengthy description of the site. No site type was listed systematically. This meant that that there was some difficulty in assigning site type to the sites. For instance, many descriptions of large structures did not clarify whether they were farms or similar sized structures. As will be seen from the results below, the number of farm sites is quite low given the wide agricultural plain on which they were situated. The Kerak Survey divided the ceramic samples into 24 periods, from Chalcolithic to Ottoman, as listed in Appendix 4. For the present study, these dates were then entered into a relationship database and correlated with site types. The ceramic dates were grouped into 10 periods from prehistoric to Late Islamic to allow for cross-project comparison (see Appendix 4 for this and the method of correlation with original periods). Of the 443 sites surveyed, 362 produced ceramic dating. 330 sites were structural sites, as defined by the DAS, of which 299 produced dating.

### Kerak results

The results of the analysis of these 362 sites are presented in Table 50 (page 456). Within the Classical period, the Kerak pattern again shows a significant dip in terms of site numbers (36% continuity) from the Nabataean to Roman period. As has been noted frequently for these pre-1990s surveys, this is probably due to the failure to understand the longevity of Nabataean wares into the Roman and Byzantine periods. There is strong continuity from the

Roman to Byzantine periods at 84%. However, there is again a significant drop from the Byzantine to Early Islamic period where only 27% of sites continued. As demonstrated by many other projects, the Kerak results also show a high continuity rate of 88% from the Iron Age to Nabataean period.

When the above sample of sites is restricted to structural sites there are some changes. These are presented in Table 51 (page 456). There are slight increases in the Nabataean and Byzantine figures where the continuity rates rise by 5% and 3% respectively. However, the overall figures remain the same as Table 50 (page 456).

The division of structural sites into various categories is presented in Table 52 (page 456). Of the seven types (State, Farm, Structure, Mill, Temple, Tower and Settlement) Mill and Temple will not be discussed here, as the sample set is too small for comparison with other surveys. As was noted above, there were problems with the definition of sites from the descriptive passages in the gazetteer and this has resulted in a large number of sites being termed Structures. This term was used in the DAS survey to denote single structures that, either due to lack of landscape context or layout, could not be defined further. However, within the Kerak samples it was clear that many of the larger structures were probably more complex, but the descriptive passages did not contain sufficient information to allow this definition. Consequently, this type forms over 38% of the total sample. However, Settlements account for over 41% of the total sample, which is no surprise given the open agricultural nature of the Kerak Plateau. In this environment the figure of 4% for Farms is clearly too low, even in comparison with other project areas. This is the result of the methodological problems discussed above. State sites form a low proportion of sites while Tower sites account for 12% of the sample.

When these Structural types were phased by ceramic dates the following results were noted. These are presented as Table 53 (page 456), which have been extracted from Tables Kerak 50–54 in Appendix 5. In many respects the series of patterns follow those established in Table 50 (page 456), where Classical continuity is followed by a major dip in sites during the Early Islamic period. Also, there are strong continuity rates from the Iron Age to the Nabataean period. However, one should note the high number of Settlement sites during all periods (even in the Early Islamic period when 44%, compared to the other types at this time, is quite high). This would seem to be matched by State sites as well. However, Tower and Farm sites clearly cease during the Byzantine and Early Islamic periods, which suggests that, as with other project areas, the agricultural system was highly volatile at this time.

The Kerak Plateau levels, surprisingly for an older survey, show high levels of continuity. However, the dips in this pattern are at the changeover from the Nabataean to Roman and the Byzantine to Islamic periods. The ceramic identification of wares in these periods suffers from clear methodological problems. In contrast, the Islamic period has quite high rates of continuity, which may be due to Brown's greater specialised knowledge of these periods. However, it is clear that State and Settlement sites continue well into the Early Islamic period. This is not seen in the samples south of Wadi Hasa and represents a different regional response at the end of empire.

## Limes Arabicus Survey

The Limes Arabicus Survey is effectively three separate survey projects undertaken as part of the main project of the same name directed by S.T. Parker. As was discussed in Chapter 2, this project is one of considerable importance for the investigation of the Roman military in the southern Jordanian landscape. The principal aim of the project was to excavate the legionary fortress at El Lejjun and several other smaller fortifications in the area. However, to put them in context, Parker carried out several surveys. His largest survey encompassed nearly every Roman military site on the desert fringe (Parker 1986a). This is not relevant to this part of the study as it was not a landscape survey but it recorded specific military sites over great distances. However, two other surveys under his direction compiled data that could be used for settlement change and variation analysis.

The first was a large-scale survey of an area to the east of the Kerak Plateau Survey that extends from the Wadi El Batra in the south to the upper reaches of the Wadi Mujib (Wadi Su'eida) in the north. It was bounded on the east by the modern Desert Highway (Figure 122, page 457). Koucky undertook this survey over several seasons; in 1980, 1982 and 1985. An interim publication was published in 1987 with tabulated data (Koucky 1987, 41–106) although this was preceded by preliminary field reports (Parker 1981, 1982, 1983, 1985, 1986b). The second survey was undertaken by Clark to the east of this main survey, to the east of the Desert Highway, along a 15km wide corridor parallel to the main survey (Figure 123, page 458). Known as the Desert Survey, an interim report was published in 1987 with tabulated data (Clark 1987). This had been preceded by several preliminary field reports (Parker 1982, 1985). It should be noted that Parker carried out several more seasons of work on the Limes Arabicus Project (Parker 1990, 1991). However, as the final publication has not yet been published the data used for analysis in this study has been drawn from the Parker 1987 interim publication.

The research strategies of both surveys were part of the Limes Arabicus Project which aimed to account for the supposed build-up of the Roman military presence on the desert edge around AD 300, and the subsequent abandonment of such sites two centuries later, well before the Arab conquests of the early seventh century (Parker 1987a, 4). The survey, undertaken by Koucky, attempted to provide a comprehensive picture of settlement in the area by surveying a "representative sample of sites". However, its main focus was on structures dating to the Roman/Byzantine period. A key focus was the delineation of the routes and attendant sites that may have been associated with Roman military and economic processes. This was to provide a context for the economic infrastructure of the region and also to reconstruct Roman military systems of observation and communication (*ibid.* 5). Clark's smaller survey aimed to understand the nomadic tribes on the other side of the frontier which, Parker (1986a) argued, stimulated the large Roman military presence. Parker reasoned that by sampling two major wadi systems that ran into his main survey area he could provide suitable data to test the movement of nomadic peoples. To this end, he focussed on campsites and pre-Islamic Arabic graffiti as the two main artefacts that could identify such nomadic movements (Parker 1987a, 5).

Both surveys found similar settlement variation, from extensive prehistoric occupation to a dearth of sites during the Middle and Late Bronze Age, followed by a rise during the Iron Age leading to the high levels of the Classical period (although in the first two centuries after AD 106 the number of sites declined). There was a large drop-off during the Early Islamic period that lasted through the Islamic period until the later Ottoman period (Koucky 1987, 78–79; Clark 1987, 120–129 & 132–136). In this regard, the results are similar to the other survey projects discussed in this chapter. Both surveys noted lines of communication and movement around military sites and nomadic camps. Koucky provides a fuller description of prehistoric sites and later Classical period towers but does not discuss overall settlement change (Koucky 1987, 54-71). However, he does provide a tabulated list of sites with site type and period (*ibid.* 80–105, Appendix A). Clark is more thorough and provides a more balanced overview of the sites encountered with basic tables by period and site type (Clark 1987, 120–129 Figs 37–40). He also has a site list with a more complete description and a breakdown of artefacts by type and period (*ibid.* 136–163).

While both survey strategies focus on the location of certain types of site (*e.g.* towers, campsites etc.), as the material correlates of nomadic or military presence, there is no discussion of the definition of such sites encountered in the field. Koucky defines an archaeological site as "man-made structures, man used features such as rock shelters and

campsites, or scatters of artifacts" (Koucky 1987, 50). Lithic scatters were only recorded when encountered close to other sites. Koucky presents his discussion of towers and prehistoric sites in a descriptive manner and does not discuss why such features should be interpreted in such a way. In his list of sites in Appendix A he mentions forts, towers, tombs, settlements, camps, villages etc., with no discussion of what these terms mean or how they are used. Clark does elaborate on site definition and how certain sites are to be interpreted. He provides a rough definition of a site which is "any location yielding evidence of past human activity" (Clark 1987, 111). He provides descriptive data on the definition of certain sites such as campsites or certain types of burial (*ibid.* 130–131) but is content to list upstanding structures as towers or watch-posts with minimal definition. Moreover, in both surveys the method for linking such sites into the overall research strategy is unclear save for the demonstration of chronological synchronicity. Considering the main research strategy of the project was to provide a regional context for military presence, the failure of both surveys to employ more interpretation and analysis is striking.

Both projects conducted the field surveys using a purposive approach through vehicular or limited pedestrian exploration. While both surveyors contend to have yielded a representative sample of sites across a large area (Koucky 1987, 50; Clark 1987, 111), they do not have the quantitative data to uphold this claim. While Clark admits his survey can only be considered a reconnaissance one, both surveys had clear aims set out in Parker's main research strategy described above: to provide a comprehensive picture of human settlement in the main area and to understand the nature of nomadic occupation on the desert survey. This would require the collection of quantitative data to employ a rigorous sampling method for site location and artefact collection. While both surveyors acknowledge that this approach would be practically impossible in logistical terms in such a vast area (Koucky 1987, 50; Clark 1987, 111), they did not alter their research strategy accordingly.

Both surveys seem to have collected all their ceramics by grab samples at the site. There is no discussion of the ceramic framework used in both surveys although Clark notes that James Sauer processed the pottery in the 1980 season, and Parker did the same in the 1985 season of the Desert Survey (Clark 1987, 112). Koucky does not mention this but it is presumed that the same personnel processed the pottery in each case. The only ceramic discussion in this publication is Parker's treatment of the ceramics from the El Lejjun excavations (Parker 1987a, 525–620). Koucky notes that the ceramic treatment of the survey will appear in the final publication. The significance of Parker's treatment of ceramics in southern Jordan and his close association with Sauer's Hesban tradition of ceramic

chronology has already been noted in Chapter 2. However, it should be stressed that this was the only survey discussed in this chapter that was linked to a current excavation project. Consequently, the methodological importance of an associated stratigraphic sequence to provide a more secure ceramic chronology has not been fully acknowledged by several of Parker's critics in their treatment of his survey results (Graf 1991; Kennedy 1992).

The data used for this study was taken from Parker's 1987 interim publication. It is an amalgam of the data presented by Koucky (1987 (I), Appendix A, 80–105) and Clark 1987, (I), 136–163). Koucky presented his data in tabular format, which contained the site name, number, site type, location with ceramic and lithic dates. Clark presented his data in a site gazetteer containing site name, location, ceramic date and site type, of which the latter was usually contained in the site description. As both surveys were part of the wider Limes Arabicus project, their methodologies were similar and the data could be entered in single database. Thus, site number, site type and ceramic dates were extracted. The Limes Arabicus Project divided the ceramic dates into 19 periods ranging from Chalcolithic to Modern, which are listed in Appendix 4. To allow cross-project comparison these were grouped into eight major periods from prehistoric to Late Islamic (see Appendix 4 for the list and the method of correction with the original periods). Of the 454 sites surveyed, 367 produced ceramic dating. Within this, 108 were part of the Desert Survey of which 77 produced ceramic dating, and 346 were of the Kerak Plateau eastern fringe of which 290 produced ceramic dating. Out of 140 structural sites as defined by DAS for this study, 130 structural sites produced ceramic dating, of which 11 were in the Desert area and 119 were in the Kerak area.

### Limes Arabicus results

The results presented in Table 54 (page 459) have been collated from Table Limes Arabicus 55 and 57 in Appendix 5. The results broadly follow other pre-1990 surveys where a significant drop in continuity from the Nabataean to Roman period is noted. The contraction is even more marked when one considers that total site numbers drop from 268 in the Nabataean period to only 64 in the Roman period. However the continuity from Roman to Byzantine is 80% while it drops to only 16% in the Early Islamic period. As in the other project areas, the continuity from Iron Age to Nabataean is high at 80%. However, the continuity rates during the Islamic period are extremely low as is the total percentage of sites. This, as with the Nabataean/Roman transition, may be due to a failure to understand the longevity of Islamic ceramics. Nevertheless, in outline, a similar process may be

observed compared to the other projects although, once again, the ceramic factors mask a full understanding.

The collation of structural sites with ceramic dates closely follows the patterns observed above. The results are presented in Table 55 (page 459), which have been taken from Table Limes Arabicus 56 and 58 in Appendix 5. The figures for the Classical period are higher compared with Table 54 (page 459) but the same pattern is clear. However, one should note the very high continuity of Roman to Byzantine sites at 93%. This more clearly marks the significant drop in site continuity into the Early Islamic period that, in structural sites, is still low at 22%.

These structural sites can be divided into five main types: State, Farm, Structure, Tower and Settlement. The ratios of these types are presented in Table 56 (page 459). It is immediately apparent that Farm and Settlement sites account for a very small part of the sample at 1% and 5% respectively. This is partly due to the preliminary nature of the published results, which lack full documentation. As with the problems noted in the Kerak Survey, this may be due, in the case of Farms, to some sites being documented as Structures. However, as the Limes Arabicus Survey was situated at the edge of the Kerak Plateau on the desert fringe, the environment may determine the lack of sites. Similarly, as the primary focus of the survey was state and communication routes, this may explain the high figure of 47% for Tower sites.

The ceramic phasing of these five structural types is presented in Table 57 (page 459). This has been collated from Table 59–63 Limes Arabicus in Appendix 5. The single figure of 100% for Farm sites is the result of only one example in this sample. Similarly, the figures for Islamic types are very low in comparison with other projects. All the types show similar high figures from the Roman to Byzantine period, ranging from 83% to 100%. In the preceding Nabataean to Roman transition, the figures for Structures and Towers are low at 14% and 22% respectively. This is in line with the pre-1990 surveys that showed drops in continuity between these periods. However, State and Settlement sites have much higher figures of 86% and 50% respectively. However, every type, except Settlement, shows a huge drop in continuity in the Byzantine to Early Islamic period. The high figure for Settlement, at 75%, is consistent with other projects where Settlement is the only site type to continue strongly.

The Limes Arabicus Survey, like other surveys of the time, used Nabataean sherds to mark the changeover to Roman rule. Thus the Early Roman period settlement pattern seems quite restricted. However, the Roman to Byzantine figures are high, suggesting that overall rates of continuity during the Classical period are high. However, the data from the Limes Project seems to match that of the Kerak Project where settlement and state sites share a certain correlation.

## Cross-comparison between all surveys

This section will directly correlate the data from all sites in a series of tables to see if there are any regional differences or similarities. As the focus of this research is the Classical period, the prehistoric, Bronze Age and Middle/Late Islamic data will not be used in this section. However, Iron Age and Early Islamic periods will be included.

The comparison of all sites is presented in Table 58 (page 460). While there are some clear differences, in essence the patterns across the projects are much the same. The high continuity rates for Iron Age to Nabataean sites is striking. Apart from the SGNAS example, all the projects show high rates from 66% to 87%. While there is still no evidence for a direct cultural link between these periods (Hart 1986b, 1987; Bartlett 1989), these high figures show the similar occupation patterns achieved during these two distinct periods.

As has been repeatedly pointed out during this chapter, the traditional division between the Nabataean and Roman period based on the presence or absence of classic Nabataean wares has now been shown to be false. The continuance of these wares into the Byzantine period is now fully accepted. This can be seen in the low rates of continuity between the Nabataean and Roman periods for all projects except the DAS. However, the SGNAS recorded a much higher rate of continuity than the rest and, as noted above, this may be due to the presence of a scholar on this team (K. 'Amr) being more fully versed in southern Jordanian ceramics than those on the other teams. In all projects, the continuity rate from Roman to Byzantine is high.

However, the WHS also recorded a low continuity rate for the succeeding Roman to Byzantine period. This is very strange, as all the other projects show very high rates of continuity. This fact is of some importance as Fiema (1991), outlining his case for military variation, mainly based his rise and fall of settlement analysis for southern Jordan around MacDonald's study. Certainly, the WHS record would suggest a highly variable settlement pattern throughout the Classical period. However, when the data is compared across all

projects the evidence suggests a much more stable system. All projects show that there is a clear drop in continuity from the Byzantine to Early Islamic period. Thus, while scholars such as Walmsley (Walmsley & Grey 2001) emphasise the continuing material tradition, it is fairly clear that there were severe dislocations during this period. However, the WHS continuity rate of only 4% from the Byzantine to Early Islamic period seems extremely low when compared to rates between 22% to 43% in the other projects. While the military and political transformations during this period are severe indeed, the evidence here suggests that a complete collapse of settlement during this period is erroneous.

When all these sites are broken down into the five site types (Structure, Tower, Farm, Settlement and State) collated from all the projects, the nature of these dislocations and continuing traditions becomes clear. This will be discussed in relation to each site type. However, one should first note the overall ratios of these types. These are presented in Table 59 (page 460). Overall, these ratios show a broad similarity for the projects south of the Wadi Hasa. However, both the Kerak and Limes projects have some variant readings. Most noticeably a very low figure of 5% for Settlement in the Limes and, conversely, a very high figure in the Kerak project at 41%. Similarly, 47% of the Limes sample is Towers, whereas the percentage of Towers across every other project varies between 12% to 17%. In addition, Farms represent only 4% of the total sites in the Kerak project and 1% in the Limes project, compared to other project readings of between 11% to 28%. Some of these issues have been dealt with above, where methodological problems in site interpretation and presentation of evidence make it hard to evaluate these readings. However, it may be that, even while taking these issues into account, the readings indicate a regional difference.

The comparison of all Structures across the five projects is presented in Table 60 (page 460). As this type is purely descriptive, relating to the number (and layout) of the particular site, its analytical use is somewhat negligible. The patterns mostly show the broad outlines, discussed above, of a strong Iron Age transition, a dip following the Nabataean period (except DAS), strong continuity from the Roman to Byzantine period, and then a severe drop to the Early Islamic period. However, MacDonald's WHS project does not conform to this pattern, but shows poor continuity during the Classical period and absolutely none at all into the Early Islamic period.

This pattern of high Classical period continuity is also followed for Tower sites and is presented in Table 61 (page 460). Again, however, the WHS material seems to show a highly variable continuity rate, which is at odds with the other projects. The other projects show a strong continuity rate until the Early Islamic period when there is a clear drop. This is

not the case with Farm sites, which show quite variant readings. These are presented in Table 62 (page 460). Although the WHS project has 28% of these types in its sample, the continuity rates are very low compared to the adjacent DAS figures. The Kerak Survey figures match those of WHS but they only account for 4% of that sample. The low Limes and SGNAS figures, based on an extremely small sample, probably reflect the lack of such sites in the semi-arid conditions in both project areas.

In contrast, the figures for Settlements, presented in Table 63 (page 461), show a very strong continuity rate across all projects except SGNAS. This high rate of continuity runs from the Iron Age to the Islamic period. While there is clear dip between the Byzantine and Early Islamic periods, it is not as pronounced as in other site types. The figure of 9% for the WHS reading seems extremely low and is not matched by all the other projects on the Plateau area. This is not matched by State sites, which are presented in Table 64 (page 461). Here it is clear that there is continuity across the Classical period, and even from the Iron Age period. However, it clearly drops in the Early Islamic period. As such, State sites match the patterns established by Tower and Farm sites.

### Conclusion

The clear evidence from the DAS project points to an extremely stable economic system of landholding patterns throughout the Roman and Byzantine periods. Contrary to earlier interpretations of a Roman decline following annexation, the evidence points to an extremely strong continuity of settlement patterns, even stretching back to the Iron Age. There are clear signs of decline in the Early Islamic period but it is not as drastic as earlier scholars have suggested. The clear continuation of Settlements and observed decline of Tower and Farm sites, suggest the collapse of a particular Classical landscape, but not overall system failure. During these periods, State sites seem to match the variability of Farm and Tower sites but do not have such an exact correlation with Settlement sites. Thus, a clear case cannot be made, as Fiema did, for the wider integration of military sites within the broader economic system.

Fiema's interpretation, while linking military variability to long-distance trade, used a systemic model of breaks in settlement patterns to argue his case. However, his evidence has now been shown to be based primarily on a survey dataset that has clear methodological problems. There are problems with many of the survey projects of the 1980s, but a thorough review of their methods and research strategies has allowed an effective reconsideration of their results. The results from most surveys confirmed the DAS data of strong patterns of continuity and the inexact correlation of military sites with the overall settlement system.

However, of all the surveys reviewed, the WHS patterns had highly variant patterns of settlement continuity. This was not so pronounced in the other projects. The review of the WHS' methodology and research strategy suggests these variant patterns resulted from clear methodological problems with the ceramic identification of local wares. MacDonald's main analytic framework laid great stress on spatial patterns of settlement data identified through a series of maps. However, as most of his dataset was based on prospection field methods, his site locations do not represent ancient spatial distribution but merely the modern project's field transects. It should now be recognised that MacDonald's and Fiema's interpretations of the WHS results, suggesting varied patterns of decline and expansion, are highly flawed.

# Chapter 8

# Imperial estates in the landscape: a review and presentation of new evidence

## Introduction

This chapter argues that there is a strong connection between imperial estates and military location. The textual evidence for the presence of imperial units in southern Israel and Jordan is reviewed and an initial hypothesis for the connection of military activity and economic resources is outlined. Next, the DAS evidence describes the spatial and temporal development of two large-scale estate units in the landscape. Within the model of resource control outlined in Chapter 2, this evidence further demonstrates a correlation between communication routes, material resources and military location.

## Research background

Millar (1993, 390), in his overview of the regions and cultures of Roman Arabia, wished to characterise the area around Petra (and elsewhere) as one of a land of small towns and villages. This gives the impression that the general hierarchy of sites ranged from single agricultural buildings and small farms, then villages and towns to large cities. Conspicuously missing from his account is an appreciation of the importance of large-scale estates. The importance of estates in the Roman Empire has been widely accepted (Crawford 1976; MacMullen 1976). They are seen as major components of the rural landscape and a direct expression of the domination of social elites in Classical society (Rossiter 1989). It is clear that they constituted a major economic role in most Classical landscapes (Parassoglou 1978; Kehoe 1988).

After the annexation of the Hellenistic Kingdoms, the imperial house would have confiscated the massive state properties of these lands. In Palestine and Jordan, as the Zenon Papyri of the third century BC makes clear, the extent of Ptolemaic royal land was considerable (Arav 1989, 127–129; Bagnall 1976, 14–21). This continued through the Seleucid period and was passed on to the Hasmoneans and the Herodian House too. In fact, there is some evidence that these Hellenistic patterns of state control in southern Palestine had Persian roots (Arav 1989, 127; Betlyon 1991). Thus, Roman imperial estates in Palestine and Jordan formed part of an existing 600 year-old pattern of land management.

However, the scale and management of these imperial estates is still a matter of some debate. Millar (1977, 175), in his discussion of the role of the Roman Emperors, held that a full overview of imperial properties cannot be written. As his discussion makes clear (*ibid.* 175–189), though, imperial properties not only included agricultural lands but also mines, quarries, clothing-works and dye-works (*ibid.* 181 and also MacMullen 1962). Moreover, regardless of a change of emperor or family line, estates would remain within the imperial house (Millar 1963, 41). Thus imperial properties were as ubiquitous and longstanding as those of that other imperial institution, the army.

Crawford (1976) attempted an overview of imperial properties from Augustus to Diocletian (27 BC–AD 305) where she discussed the acquisition and management of such properties. In her Appendix (1976, 57–70) she listed only two estates in *Judaea*, three in *Syria* but none in *Arabia* (*ibid.* 63–64). However, as Crawford limited her discussion to sources within the first three centuries AD, she would have ignored later Byzantine sources that attest the existence of imperial estates in *Palaestina*. This limited chronological approach is understandable in a historical appreciation of source material but it underestimates the longevity of these state landholding patterns. This is partly due to the scanty evidence for such estates where, at least for the Nabataean Kingdom, there is no contemporary textual or epigraphic evidence for royal lands. It was only with the publication of the Babatha Archive that Nabataean royal land passing to imperial use was attested (Lewis 1989; Cotton 1997, 261).

However, many of the above discussions are solely concerned with the role of imperial estates in the Roman economy (*e.g.* Safrai 1994; Hopkins 1980). These debates remain rooted in the administration of these economic units by the government (Millar 1963; Brunt 1966; Duncan Jones 1964). However, for Jordan, Graf has recently proposed a connection between imperial estates and military locations (Graf 1997a, 129–131). He notes the textual references to estates in the Byzantine period and the link with some military locations. He develops this further and suggests that many sites on the desert fringe, such as at Diyatheth (Kennedy & Riley 1990, 194–196) could be centres for furnishing cattle (Graf 1997a, 131 citing Villeneuve 1986, 710). While the existence of large-scale animal herding on imperial estates is well attested (*cf.* Macmullen 1962, 277–279), one should note that Graf's overall position in this article is to demonstrate the non-military nature of the forts on the desert fringe *contra* Parker's (1986a) view of the linear military frontier. As was shown in Chapter 6, this led Graf (1997a, 124–129) to deny the existence of a desert road (a *via militaris*) linking military sites. However, the demonstration of this route by the DAS project, while

showing that it was not directly related to military locations, suggests that forts were not engaged in the development of the desert fringe.

Nevertheless, Graf's suggestion of a link between imperial estates and military location is valid. The topic, however, is barely noted by most researchers of the Roman army in the Levant. Pollard, in his analysis of the army in Syria, only notes a connection where there are epigraphic references to military surveyors in imperial estates in Lebanon (Pollard 2000, 241–242). Alston's (1995) study of the Roman Army in Egypt makes no reference to any connection, which is striking given the importance of estates in Egypt during this period (Parassoglou 1978). In his more complete economic discussion of estates in Palestine during the Roman period, Safrai (1994, 326) notes a connection between estates and military location. However, he does not develop this later in his study when he discusses the influence of the Roman Army in the area (*ibid.* 339–348).

## Textual evidence

### Estates

This section will provide a brief overview of the textual evidence for imperial estates in southern Jordan and Israel. There are 16 attestations which are tabulated in chronological order in Table 65 (page 462). This section will not discuss any references to modes of production as the aim is to provide a spatial pattern. The first three entries in the list will not be discussed further as they are clearly not located in the study area. However, one should note that Pliny's *horti regii* producing balsam might relate to such activity at En Gedi (Safrai 1994, 148). En Gedi is clearly referred to as part of an imperial estate in the Babatha Archive (Lewis 1989, 42–43). The Babatha Archive also mentions another estate at *Moaza*, near modern Safi, once under the Nabataean Kings and then in the Roman period (Lewis 1989, 66–27; Cotton 1997, 257). As was noted in Chapter 3, Inscription 4 of the Beer Sheva Edict, dated to the early sixth century, seems concerned with imperial lands. Overall there are six entries of imperial lands, listed in Table 65 (page 462). Three of them refer to a Σαλτων (*Saltus*), which is an imperial estate that was a single administrative unit (Kehoe 1988). One is mentioned by name, Σαλτων Κωνσταντιανιχης , which was correlated in Chapter 3 with the site of *Menois* in the *Notitia Dignitatum* (*ND Or.* 34.19) which had a military garrison, *Equites promoti Illyriciani,* around AD 400. Eusebius also records a military garrison there around AD 300. This is now called Khirbat Al Ma'in and is 20km south-west of Gaza. There is little of archaeological note at this site except a synagogue (Stern 1993, 944–946). A church has also been excavated there (Tsaferis 1985). A further location in modern Israel is also mentioned. This is the site of Τερεβινθος, Haram Ramat Al Halil, which is on the main

route from Tell El Milh (Malhata) to Jerusalem. It was a famous market-place where Jewish captives were sold into slavery at the order of the Emperor Hadrian (Tsafrir *et al* 1994, 177–178). The site is close to the location of a known military site at *Chermula* (modern Kirmil) on the main road from Tel El Milh to Jeruselam (see Figure 28, page 346).

The Beer Sheva Edict also mentions two pieces of land as being in the territory of modern Petra and Gharandal. These may be connected with the reference in the *Petra Papyri* of an imperial house between Petra and Augustopolis (probably Udhruh) (Koenen 1996, 178–179). It may also link to a later listing of towns in Palestine made by George of Cyprus who details a Σαλτων ίερατιχου (Salton Hiertikon) somewhere to the north of Petra. The same listing also mentions Σαλτων Κωνσταντιανιχης (Honigmann 1939, 43–44). In the same period the Madaba Map lists an estate, *Saltus Gerariticus* in the Negev, which is correlated with Khirbat Al Far (Donner 1992, Schaefer 1979, 66–83).

There may also be other references to estates that have survived in the modern names of sites. Graf notes the modern town of Salt near Amman, which may have retained this name after being a *Saltus* in the Roman period (Graf 1997a, 131). Applebaum (1989, 108–109), in his discussion of royal estates around the Jezreel Valley, notes the frequent Arabic name *firdusi*, which may relate to royal lands. However, as Millar (see above) had noted, the imperial properties could also contain mines, quarries and industrial works. In this regard, the attestation of Roman troops at the copper mines of Timna in the Wadi Arabah is noteworthy (Rothenberg 1972, 211–212, 222–233). Further north at Faynan, as was shown by the evidence from the Beer Sheva Edict in Chapter 3, there was a military garrison in the early sixth century. Indeed, an earlier military presence at Faynan could be deduced in the reign of Diocletian when people were exiled there to work the mines (Kennedy 2000, 201). The scale of both these mines was immense (Rothenberg 1972; Hauptmann & Weisgerber 1992; Hauptmann 2000). Lindner (1992, 263–268) has also noted copper deposits in the Wadi Abu Khusheiba, near the Roman fort of Bir Madhkur. Finally, one should note the spatial connection of a fort with a perfume (balsam) factory at En Boqeq on the shores of the Dead Sea (Gichon 1993).

### *Fabricae*

In addition to imperial estates and units exploiting mineral resources, one should note imperial industrial centres, *fabricae*, which were established in the later Empire. The collapse of the financial system in the mid-third century had profound repercussions for the Empire as a whole, and the reforms of Diocletian have been attributed to the development of new systems of control and management (Williams 1985). As a result the Empire

constructed a series of industrial centres (*fabricae*) to mass-produce arms and armour to supply the various frontier armies (James 1988). During the Principate the army was supplied mainly from civilian suppliers but the economic strains of the third century halted this. Also, during this period, changes in the composition of the army favoured the use of heavy cavalry (Treadgold, 1995, 57; Southern & Dixon 1996, 9–20). In particular, the supply of arms and armour for specialist cavalry regiments, the *clibinarii* or *cataphracti,* was quite expensive (MacMullen 1960, 29–31). James (1986) saw the development of more standardised helmet designs as reflecting a simplified and efficient approach to arms manufacture.

The location of these *fabricae* is of enormous significance to the interpretation of the southern Jordanian fort and road network as a vast resourcing system. James (1988), in a comprehensive review of the historical evidence for these centres, has argued persuasively that the distribution of *fabricae* is proof of an overall strategy for the supply of armour to the Roman Army. The location of these centres is known primarily from the *Notitia Dignitatum* and certain literary and epigraphic texts (*ibid.* 257–261). The *Notitia Dignitatum* lists the location of centres of arms production in Syria at Damascus, Antioch, Edessa and several others that are now in Turkey (*ND Or.* 11):

*Fabricae infrascriptae: Orientis V: Scutaria et armorum, Damasci. Scutaria et armorum, Antiochiae. Clibanaria, Antiochiae. Scutaria et armamentaria, Edesa. Hastaria Irenopolitana Ciliciae: Ponticae tres: Clibanaria, Caesarea Cappadociae. Scutaria et armorum, Nicomediae. Clibanaria, Nicomediae. Asianae una: scutaria et armorum, Sardis Lydiae.*

As was noted in Chapter 3, the *Notitia Dignitatum* dates to between AD 386–394 (Kulikowski 2000, 372). However, John Malalas (Malalas 13), a late sixth-century Syrian Chronicler, noting that there are three armouries at Antioch and one each at Edessa and Damascus, states that all were founded by Diocletian. While the origins of the *fabricae* are obscure, James argues for a Tetrarchic foundation for the overall distribution of these centres (James, 1988, 266). However, when he correlated the locations of *fabricae* with the provincial structure he noted: "the pattern is so regular that it betrays deliberate planning [where] pairs of armour factories correspond exactly with the dioceses." (*ibid.* 263; Figure 139, page 479). James (*ibid.* 267), following Jullian (1896, 960), contends that access to mineral resources was a paramount consideration. However, he notes that strategic communications seem to have been a consideration in the siting of *fabricae* in urban centres capable of maintain a large skilled workforce (James 1988, 267–269).

James notes examples of the correlation of road networks with *fabricae* in all parts of the empire except the eastern frontier area (*ibid.* 268). However, he fails to note the extensive mineral resources of the Wadi Arabah, at Timna (Rothenberg 1972, 1988), and in the Wadi Faynan (Hauptmann 2000). The extensive copper mineral resources of the Faynan have been shown to have some of the largest mines in the empire, such as Umm El Amad (Hauptmann & Weisgerber 1992, 65). The persecutions of Christians during the reign of Diocletian provided numerous workers for the mines at *Phaeno*. The horror of such a sentence is vividly recorded by Eusebius (*Hist. Eccl.* 8.13.5; *Mart. Pal.* 7.4, 13.1–3) where "*damnatia ad metalla*" was a death sentence. The direct involvement of the state in the running of these mines is seen in Eusebius' reference to a "superintendent of mines". Moreover, as was shown in Chapters 3 & 4, all of these sites had military outposts. In the case of Faynan, the connection with the location of the imperial estate, around Qadisiyah on the Plateau, again demonstrates the familiar pattern of resource, communication route and military site. Most importantly, the two-hour trek to the Plateau at Qadisiyah allowed access to the nearby *via nova Traiana* or a 10km journey to the desert route past the fort at Khirbat Dajaniyah.

It is proposed here that the foundation of the desert road in the later third and early fourth century, shown in Chapter 6, and the presence of the copper resources intensively worked in this period, can be correlated with the establishment of *fabricae* in Syria. One should also note that Diocletian increased military pay enormously from 75 *denarii* to 300 *denarii* by devaluing higher currencies and putting cheaper copper coins into the economy (Alston 1994; Hendy 1972). There was thus a more sustained need for copper than before. Therefore, it is suggested that the establishment of the desert route and a military presence at Lejjun, Dajaniyah, etc., is part of this greater infrastructure development. The desert route links these forts with the major centres of Syria and consequently with the supply of material, via whichever source, to the major imperial field armies in Syria.

This brief overview clearly points to some kind of spatial correlation between military sites and imperial estates/industrial units. As the textual references are so scant for these sites, a temporal correlation cannot be attempted. The lack of specific estate locations in southern Jordan does not advance the hypothesis of a strong link between military locations and imperial estates, although the references that do exist point to an area to the east and north of Petra. Since there are no corroborative textual sources, one has to rely on archaeological evidence.

## Archaeological evidence

Although there are historical references to estates in southern Jordan, the archaeological correlates are not easily discernible at a landscape level (Graf 1997a, 131). Applebaum, in his discussion of imperial estates in the Sharon plain and Samaria areas, identifies such entities by inscriptions (Applebaum 1989, 102–103). There has been no attempt to elucidate such features in the landscape of southern Jordan. Barker, in his discussion of the field systems of the Wadi Faynan and the effects of the mines on the environment, notes that this area "had become a highly organised imperial estate organised by the Khirbet Faynan garrison" (Barker 2002, 499). He does not cite any textual or archaeological data source for this.

Even in Israel, where the textual references are more numerous, there is still a limited archaeological awareness of imperial estates. In his treatment of the settlement patterns of *Palaestina Tertia*, Gutwein (2000) barely touches on the subject. Similarly, Dauphin (1998 I, 72–73) in her wide-ranging study of Byzantine Palestine, while referring to them, does not discuss the presence of these estates in the overall settlement pattern. This is mainly because of certain assumptions about the structure of settlements in the southern Levant. In his discussion of the farms and villages of Byzantine Palestine, Hirschfeld (1997) contends that while the economy of the western Roman Empire was based on large-scale estates, that was not the case for the Roman East. While he acknowledged the existence of estates from written sources, he emphasised that the internal autonomy of the village structure and the numerous smaller farmhouses suggested a more diverse landscape than one dominated by a few landowners (*ibid.* 60–65). He notes the existence of two main types of farmhouse, the first of which he calls "simple", which is usually "a rectangular structure of two or three rooms facing a fenced courtyard" (*ibid.* 67). The second type is more complex and is usually built around a courtyard. They sometimes have a tower and are sometimes indistinguishable, at a survey level, from monasteries or military structures (*ibid.* 68–70; Hirschfeld 1998).

A major problem with the study of estates in the southern Levant is that any analysis concentrates solely on the site morphology of the villa (*e.g.* Rossiter, 1989). In his discussion of the role of villas in the Arabian countryside, Graf (2001, 227–230) focussed solely on the search for this single structure as the key to understanding estates. This narrow approach assumes that a villa/large farm would sit at the centre of an estate. However, it is clear that these estates existed for considerable periods of time and change in land patterns is inevitable. What is required is a broader landscape approach that does not focus on a single piece of diagnostic site plan.

In the following sections the evidence for two large estates is presented. The first estate was already known, but its true significance was unrecognised. The second estate is a new discovery. Both features were discovered using textual references and pedestrian survey methods within a landscape framework.

## The Ma'an evidence: forts or farms?

The archaeological remains around Ma'an have received very little attention. This is somewhat surprising given Ma'an's strategic location as a natural stopping place for travellers heading to the Arabian interior. Today, it is one of the main transit routes for pilgrims heading to Mecca on the annual Hajj, from which Ma'an derives its greatest income. Previous research in the Ma'an area had identified several sites that seemed to link extensive water management and agricultural features with military forts. However, as the DAS had tracked the desert road – the so-called *via militaris* (see Chapter 6) that appeared to head towards Ma'an – the connection of these forts with a wider imperial system was investigated.

### Previous research on Ma'an

Archaeological remains in the area around Ma'an had occasionally been reported by nineteenth-century travellers (*e.g.* Hill 1897). Most reports are summarised in Brünnow & von Domaszewski 1905, 4–5. Musil, in particular, had noted the significance of the remains as an area of irrigation (Musil 1926, 3–4). The only tangible Classical remains are the sites of Al Hammam (DAS 391; Brünnow & von Domaszewski 1905, 3–4;) and Al Mutrab (DAS 331; Brünnow & von Domaszewski 1905, 4), of which the former has long been identified as the site of *Admatha* (*ND Or.* 34.33) where a camel unit, the *Ala Antana dromedariorum* was stationed (Parker 1986a, 101 note 69; Fiema 1991, 295, 301; 2002b) (Figure 126, page 464). These sites are now located on the north-east fringe of Ma'an.

Brünnow & von Domaszewski provided the first archaeological survey of this set of remains during their survey in 1897. However, they had already been heavily disturbed by stone quarrying for the local towns of Ma'an and As Samije (the latter of which Brünnow & von Domaszewski calls Klien-Ma-an). They also reported that stone from the larger buildings had been used for Turkish military buildings (presumably in Ma'an itself). They identified six main monuments. The first they termed a "Kastell" (see Figure 124, page 463; Brünnow & von Domaszewski 1905, 4 Fig. 552; marked A) which was situated on the main hill. The second building, which they termed Al Hammam, was situated to the west and was referred to as Building B (Figure 124, page 463). To the north (and completely out of position with

the rest of the monuments) was a large reservoir 75 paces wide (Building C in Figure 124, page 463). East of the main Kastell was another building D (Figure 125, page 463) (Brünnow & von Domaszewski 1905, 3, Fig. 550–551). Stretching away to the east from this point was a long wall that joined another site termed Al Mutrab, which was also planned and was 45m square and seems to be a large courtyard building (Brünnow & von Domaszewski 1905, 5, Fig. 554).

Stein subsequently surveyed the area in 1939 (Gregory & Kennedy 1985, 295–301) and produced a plan of Al Hammam that showed it to be a square courtyard building (Figure 48, page 371). Noting comments from RAF pilots about the existence of ancient fields, he concluded after a ground survey that it was a large irrigation scheme fed from a reservoir. However, Stein did not believe the irrigation scheme was Roman and referred to textual sources recording the construction of an aqueduct by Sulaiman I (1520–66) in Ma'an (Gregory & Kennedy 1985, 301).

Parker surveyed the sites of Al Hammam and Al Mutrab in 1976 as part of his Limes Arabicus Project and concluded they were *castella* (Parker 1986a, 100–103). He commented on the lack of towers and thin walls compared to other military sites. But he found a parallel in both buildings with similar buildings at Umm El Jimal and Qasr El Baiq which have been dated by inscriptions to an early Byzantine date (Parker 1986a, 102). He improved on Stein's plan of Al Hammam (Parker 1986a, 101, Fig. 45) which now shows a building, 61 x 51.5m, with walls 1.2m thick. Parker merely reproduces Brünnow & von Domaszewski's plan of Al Mutrab (Parker 1986a, 103, Fig. 46) but notes that the site is 47m square, not 45m square as listed by Brünnow & von Domaszewski (Figure 49, page 372). He noted that the wall leading from Al Hammam to Al Mutrab was not a wall but an aqueduct that fed water to Al Mutrab (Parker 1986a, 102). However, Parker was the first to provide secure ceramic dates for both structures and he demonstrated that they were in use from the later Byzantine to the Islamic period (Parker 1986a, 175, 179).

Gregory, in her gazetteer of Roman sites, discounts Parker's identification of the sites as *castella* on the basis that the parallels cited by Parker were not secure. Although Parker's ceramic dates confirmed a later Byzantine date, Gregory showed that the contextual evidence of the inscriptions from other sites was inconclusive (Gregory 1997 II, 392–394). However, she seems to accept Parker's observation that an aqueduct ran to Al Mutrab (*ibid.* 394). Kennedy's recent (1998) aerial description of the sites still assigns a military function, based on the assumption that the area does include a military presence, although in the main he follows Gregory's scepticism (Kennedy 2000, 175). However, his aerial survey provided a

sketch of the irrigation scheme that Stein described (Kennedy 2000, 176, Fig. 18.3). He also includes an aerial photograph (Figure 128, page 466) of the reservoir with the courtyard building planned by Parker and Stein and referred to as Al Hammam by Brünnow & von Domaszewski. Unfortunately, between the 1998 aerial survey and the 2000 ground survey by the DAS, this building had been destroyed by quarrying along with other archaeological remains to the east of Al Hammam.

Nonetheless, after 100 years of archaeological research, the site is still treated as a military site, albeit with extreme reservations by some. The site is still mentioned in discussions of military deployments in the Petra area (Fiema 2002b, 38). This has been stimulated by attestation, in the *Petra Papyri* 67 of the early sixth century (Gagos & Frosen 1998, 475), of a *Flavios Dusarios* who was an ex-commander of the post at *Admatha* (ἀπό πραιφέκτων Κάστρου Αμμαθων) (see Fiema 2002b, 40). As was noted in Chapter 4, the correlation of Al Hammam with *Admatha* is not secure and it is unclear why it continues to be accepted as such.

### DAS survey evidence

The DAS survey of these sites quickly established their unitary nature as part of a vast enclosed irrigated scheme. While earlier surveys had hinted at a connection with irrigation, their focus – the narrow analysis of major sites – had obscured the true significance of the overall complex. Within the framework of a landscape approach, DAS was able to see these sites as part of an integrated irrigation system.

The survey of these sites was achieved by a combination of vehicular and pedestrian survey methods. Most of the water channels and walls were plotted using a GPS, while the major sites were mapped. Thus, a reasonably accurate map of the whole complex could be constructed. As one can see from the resulting map (Figure 127, page 465), the whole scheme occupies an area of 5 x 3km. It was clearly planned as a unitary feature and represents a unique discovery in southern Jordan. Apart from the Hejaz Railway that cuts the site, the only other feature is a relatively modern building: DAS 330, a Turkish WW1 structure with machine gun post.

The complex, termed DAS 335, was broken down into the following components: Five main structures located at several key positions round the edge of the irrigated area, including DAS 328 (probable site of Al Hammam) and the attendant buildings around it. DAS 392, probably Brünnow & von Domaszewski's Building D; DAS 391, building debris of

Brünnow & von Domaszewski's Building A. Two further sites are located to the east of this area: DAS 332 Khirbat Al Samra; DAS 331 Khirbat Al Mutrab.

The water supply probably came from a spring near Ma'an called Ain Sherawi and was transferred, via an aqueduct, DAS 326, to the main reservoir, DAS 327, located beside Al Hammam (Figure 129, page 467). There was a second water storage unit, DAS 337, at the eastern end of the complex. The water was managed by a system of channels and wall run-offs (DAS 329) feeding off a main central channel leading from the main reservoir, DAS 327. Several structures (DAS 333, 334, & 336) and associated sluices were distributed along the main central channel.

Nine components of the DAS 335 complex produced ceramic samples that could be dated. These are DAS 326, 328, 330, 331, 332, 333, 334, 391, 392. They are tabulated in Table 66 (page 466). Apart from DAS 330, which is clearly a modern building, the sites show a clear progression from the Late Roman to Early Islamic period. This is broadly in accordance with the dates obtained by Parker for Al Hammam and Al Mutrab (Parker 1986a, 179). These ceramic dates and the range of sites surveyed by DAS demonstrate that the system was clearly begun in the Late Roman period, contrary to Stein (Gregory & Kennedy 1986) and Gregory (1997 II, 394).

### Main Structures of the DAS 335 complex

The following sections will describe in more detail the components of the complex. The main structures will be discussed first, then the water storage features and, finally, the water management systems.

### DAS 328 (Probable site of Al Hammam)

As was noted above, quarrying activities carried out between Kennedy's aerial survey of 1998 and the ground survey by DAS in 2000 extensively damaged the main area. The most important damage was the almost complete removal of the site of Al Hammam. Some wall lines were visible as limestone "stains" which was enough to show the general area of the building. The destruction of this site presented severe problems for the reconstruction of the overall scheme of the site and it was necessary to refer to earlier surveyors' work. It is clear from Kennedy's (Kennedy 2000, 175, Fig. 18.2 and Fig. 18.3 (marked B)) aerial description that this is the same site that Parker (Parker 1986a, 101, Fig. 45) and Stein (Gregory & Kennedy 1986, Fig 28) surveyed. All these surveyors have linked this with Brünnow & von Domaszewski's Building A (Brünnow & von Domaszewski 1905, 4, Fig. 552) termed a "Kastell" (Gregory 1997 II, 394) (See Figure 124, page 463). However, Brünnow & von

Domaszewski referred to another Building B as Al Hammam which lay to the east of Building A. There is no plan of this site but Building B is called explicitly "eines großen Gebäudes, jetzt el-Hammam genannt" (a large building, now called Al Hammam).

Thus, it is unclear which site is Al Hammam. If the name continued to be attached to the same site until Stein surveyed it 30 years later, then Brünnow & von Domaszewski were referring to another building as Building A Kastell. However, if Building A Kastell is the site surveyed in 1939 as Al Ahmmam by Stein, then Building B, which Brünnow & von Domaszewski called Al Hammam, is another site entirely. Unfortunately, Brünnow & von Domaszewski's sketch map is inaccurate in the one element that could fix the position of the other sites (Figure 124, page 463). This is the relationship of the reservoir (termed C in Brünnow & von Domaszewski's Map) to its adjacent Building B. As Figure 129 (page 467) shows, the site now termed Al Hammam is 60m to the east of the reservoir. Brünnow & von Domaszewski put the reservoir somewhere to the north-west of both buildings. This would not be the true relationship of either building if it were the site now termed Al Hammam. However, one should note the position of Building A in relation to the slight contours produced on the sketch, which has the effect of showing a hill. The reservoir and attendant sites are on the same ridge but about 300m to the east of the area is a hill, which unfortunately has been considerably quarried for stone.

DAS carried out a survey of the area and found quantities of large building blocks, pavement slabs, grinders and sherds. In addition, numerous red and white polished marble fragments were found and some of these were clearly pillar fragments. This was designated DAS 391 (Figure 129, page 467) but there were no in-situ remains that could be spotted under all the debris. It could be that the debris represents spoil from Al Hammam to the west or is a new building entirely. However, on the north-east edge of the hill containing DAS 391, a stretch of walling was found which might represent Brünnow & von Domaszewski's Building D. They recorded a building 27 x 15.27m with stone slabs. A 2m stretch of walling (DAS 392) was noted that still stands to about five courses in height (1.80m) and may have been the eastern wall of Brünnow & von Domaszewski's Building D (Figure 129, page 467). Thus, the remains of DAS 391 could be Brünnow & von Domaszewski's Building A Kastell. If so, it has been completely ignored by every surveyor since Brünnow & von Domaszewski's initial survey. As they had termed it a "Kastell", it is unclear why Parker's survey did not comment on it. As the site is now clearly destroyed, this inattentiveness is regrettable.

## DAS 331 Khirbat Al Mutrab

Also written as Ammu-t-Trab by Musil (1926, 3) and Stein (Gregory & Kennedy 1985, 299), the site of Khirbat Al Mutrab lies on a small knoll overlooking a large shallow wadi to the south. A roughly square building (Figure 130, page 468), *c.* 44 x 46m, it conforms to the standard pattern of courtyard buildings with a series of rooms around a courtyard. There is a definite entrance on the eastern side. The wall referred to by Brünnow & von Domaszewski and Stein abuts the north-west and north-east corner of the site (Figure 127, page 465, Field wall I) although the site has been badly damaged by bulldozer cuts on this side. Constructed of limestone walls 0.70m wide and surviving to several courses in height the building is not covered by much rubble, which suggests it may have had a mudbrick superstructure. Lying within the main bulldozer cut on the north-west side are two large grinder fragments (probably 1.20m wide with a central hole). This grinder may have been the circular hearth feature noted by Brünnow & von Domaszewski and is located in the south-west corner (Brünnow & von Domaszewski 1905, 5, Fig. 554). A large block of limestone (1.10 x 0.70 x 0.80m) lies outside the structure to the west. With a square cut of 0.50 x 0.05 x 0.10m at one end it may be a large weight.

## DAS 332 Khirbat Al Samra

One kilometre to the north of Al Mutrab, DAS located a new site, Khirbat Al Samra (DAS 332), that has almost exactly the same layout as Al Mutrab and Al Hammam (Figure 131, page 469, and see plan in Kennedy 2000, 176, Fig.18.3 Site D [however note Site C, not D, should be Al Mutrab on Kennedy's plan]). It was complete in plan and, unlike Al Mutrab and Al Hammam, it was not damaged by bulldozer activity (Findlater 2002, 141). Measuring 50 x 51m, the structure is set on the northern edge of a large wadi. Constructed of roughly squared limestone and chert blocks, the walls are 1.4m wide and 1m high. Internal walls are usually 0.70–0.90m. There was a discernible lack of rubble around the site and the even height of the walls suggests that the superstructure had been constructed of mudbrick. Internal rooms vary in size but most are 5m wide and 3m long. Additional rooms have been added in the north-west, south-west and south-east internal corners. The entrance is on the eastern side although a modern track has been driven into the site on the southern face. The south-west corner of the site has been badly damaged by bulldozer cuts. As with DAS 331, a field wall abuts the north-west and north-east corners (Figure 127, page 465, Field wall II). There is an area of rough cobbling along the external southern wall that forms low platforms. It is surprising that both of these sites were continually interpreted as military features in the

academic record. The thin walls, the presence of clear agricultural debris such as grinders and the overtly *caravanserai*-like plan does not suggest a military function.

### Water supply and storage

The water supply for the whole system came from a spring called Ain Sharawi, which directly fed the aqueduct, DAS 326. Ain Sharawi flows into a small pool in a wadi bottom called Al Ghadeer. From the spring, according to an old man in the area, the aqueduct ran west possibly into the wadi. There are the remains of an old wall leading west from the spring but it disappears into the old mud-walled gardens and must have been the feeder channel for them. Thus, the water may be connected to an even larger system related to the walled gardens of Ma'an, south of DAS 335.

The aqueduct (DAS 326) is, in most places, a raised water channel leading into Reservoir 327 from the west. It begins as a single concrete-lined channel at ground level and, as it approaches the reservoir, is raised on a stone built embankment 3m high. Fifty metres before the reservoir this raised aqueduct ends and the channel drops at 45° into a series of indistinct structures before it re-emerges as a single channel leading towards the reservoir.

### DAS 327: reservoir

DAS 327 is the main water storage unit of this complex. It is a square sunken reservoir (*c.* 60 x 60m) set just to the west of site of Al Hammam (DAS 328). Constructed of large, well-dressed limestone blocks it is fed by the aqueduct, DAS 326, entering it from the west (Figure 129, page 467). The depth of the reservoir at present is 4.60m at its deepest point. This may be close to its original depth as a portion of what seems to be original floor has been exposed at this point Just before the reservoir, the aqueduct, DAS 326, feeds into a concrete-lined basin that must have functioned to remove silt etc. (although it has been damaged by modern digging). To the east of this basin is another area of modern disturbance masking the actual entrance to the reservoir. However, on top of the reservoir's west wall are faint traces of a possible channel.

### DAS 337: smaller reservoir and cistern

DAS 337 is an earthen reservoir set on the eastern side of Channel VII at the eastern end of the irrigated area. The external dimensions are 42 x 50m with a bank that is 3.50m high. The internal reservoir area is 22 x 25m. There has been recent damage along the western side on Channel VII that obscures the inflow to the reservoir. Immediately to the north is a 5m diameter cistern that has been stone lined and cemented on the bottom and sides. An outflow

area was noted to the north of this feature. Both these reservoirs fed a large area of the complex to the north-east (see Figure 127, page 465).

### Water management features

The ground survey by DAS, to the east of the main reservoir and the site of Al Hammam, located a channel (Channel III) that heads east for 5km (Figure 127, page 465). This was not the aqueduct thought to be between Al Hammam and Al Mutrab (Parker 1986a, 102). The aqueduct noted by Parker (1986a, 101) and followed by Gregory (1997 II, 394) is, as Stein and Brünnow & von Domaszewski correctly noted, a rubble wall. DAS showed that it enclosed a massive 5 x 3km area that was irrigated by this central channel (Figure 127, page 465) (Findlater 2002, 141–142). These channels and walls (DAS 329) form a 5 x 3km-area fed mainly by a central channel (Channel III) which takes water from the reservoir, DAS 327. The whole irrigated area is enclosed by long rubble walls I, II, IV and V. At the eastern end of the system, several other channels are apparent. These are Channels VI, VII and IX. A large reservoir, DAS 337, is associated with Channel VII. A further channel, Channel VIII, represents an extension of the main Channel III but appears to have been unfinished, but it seems clear that an even larger area was to be irrigated.

Along the central Channel III were located several sluices from which ran perpendicular channels to the interior of the area. Situated by each of these sluices were small, usually single, structures (DAS 333, 336, 334) (Findlater 2002, 142). DAS 333 is a small structure (10 x 4m) set 30m north of Channel III. The structure is built of limestone bifacial walls 0.50m wide that survive to 0.30–0.60m high. DAS 334 is an L-shaped structure set 14m south of Channel III. Covering an area 6 x 12m, it was constructed of bifacial limestone walls 0.50m wide that survive to one course in height. Fifteen metres to the west of the structure, perpendicular to Channel II, are the remains of a sluice and a channel that stretch for some distance to the north and south (Channel VI). The sluice, set at an angle to Channel III, is about 0.80m wide and is one course high (0.20m). Channel VI is about 0.80m wide. DAS 335 is a rectangular structure set to the north of Channel III and DAS 333. Measuring 5 x 8m it has been badly damaged by a bulldozer cut. It is constructed of small bifacial walls 0.40m wide that survive to one course in height. A grinding stone was noted in the bulldozer debris.

### Discussion

The scale of this irrigation is immense and represents a huge investment. All sites contained not only Late Byzantine but also Early Islamic pottery. The enclosure of the walls and the

location of the sites – Al Hammam and the reservoir at the western end of the site with Al Mutrab and Samra on either side of the central Channel III – suggest a centrally planned, massive irrigation network. It was begun in the later Byzantine period and extends into the Early Islamic period. The sites should not, however, be termed military, or included in any theory regarding the military location of Byzantine forces. If any military site was located in this area during the Classical period, it is more likely to be in the environs of Ma'an (Findlater 2002, 142). Thus, one cannot postulate a correlation between military location and a large estate in this instance.

As was shown in Chapter 7, settlement sites clearly continue into the Islamic period. The excavations carried out by Walmsley in Gharandal (Walmsley 1998; Walmsley & Grey 2001, Walmsley *et al* 1999) to the north of the research area shows clear rural continuity and settled occupation through to the Early Islamic period. Clearly, rural settlement and its stability were not linked to military security. Furthermore, the later date of the Ma'an sites discussed above and others such as Jabal Tahuna (Kennedy 2000, 173 Fig. 17.8; Killick 1986, 438–440), demonstrate that massive agricultural/irrigation projects were carried out, supposedly in a climate of shrinking imperial control. Thus, economic variability cannot be linked directly to the presence of imperial units. It is clear that the growing body of data suggests dynamic and diverse cultural systems within the Roman/Byzantine period. Older models of colonial control, stressing dominant coloniser power relations, must be modified to explore the varying scales of Roman control and exploitation (Findlater 2002, 144).

### Imperial Estate: the *Salton Hieratikon*

Eusebius records that a χώμη (villa) called Θαιμαν (*Thaiman*) is 15 or five miles from Petra (Klostermann 1904, 96 *Onom.* 2.19–21). He also records that there is a military garrison there. Bowersock (1983, 175, note 27) has equated this name with *Thamana* from the *Notitia Dignitatum* (*ND Or.* 34.46) where the *cohors quarta Palaestinorum* was stationed. However, this was discounted in Chapter 3 where *Thamana* was associated with the site of Θαμαρα (Mezad Thamar) in Israel. Avi-Yonah (1976, 101) has suggested that this villa could be equated with the estate in this area, *Salton Hieratikon*. This royal estate was mentioned by the Byzantine geographer George of Cyprus as being in the metropolis of Petra. Possibly comprising a sacred area, it was associated with the Nabataean royal family. This of course was confiscated upon annexation. The location is unknown but believed to be north of Petra. The modern village of Megdes in the Shaubak area was suggested as the possible site (Graf 1997a, 131 quoting Honigmann 1939, 43–44) (Findlater 2002, 143). The site was visited by Musil (1907–08, II 2, 236), Glueck (1935, 88 Site 145) and Hart (Hart & Falkner 1985, 270

Site 84) but nothing of note was reported. The site was surveyed by DAS (DAS 241, Khirbat Megdes) but there was nothing to suggest any large buildings that could be associated with the centre of an estate.

### DAS survey of unit 381

Within the DAS area, however, a set of sites and features may be interpreted as belonging to a large diverse managed landscape reflecting an imperial estate (DAS 381, Figure 132, page 470). To the east of Dana, and straddling the *via nova Traiana*, a series of roads was located which connected small farms and single structures, forming field boundaries. The occurrence of this type of system was not noted in other areas of the survey universe where field systems formed discreet units such as the Ma'an example above, or else were part of cross-wadi wall systems (*cf.* Chapter 6, DAS 193, Khirbat Qannas). Several tracks may have been roughly paved. Kennedy (1998) had already noted two elements of this landscape. First, a large circular structure located to the east of the *via nova Traiana* lies within this field system (Kennedy 1998, 579, 581). Second, the fort noted by Kennedy (1998, 579–582) is really only a massive field clearance wall, but it does serve to demonstrate the substantial and widespread clearance and thus investment that occurred in this area. Most of the structures have pottery ranging in date from Nabataean first century BC/ first century AD to the Byzantine period, with occasional Iron Age and Islamic sherds. Most structures occur on nodal route points. They range from single, simple rectangular structures and farmsteads to small settlements. It is a massive and intensive use of the landscape (Findlater 2002, 143).

As the tracks are the defining aspect of this estate system the description of the remaining sites will be listed in relation to the field system. This will be achieved in three sections. First, sites that connect to tracks or else are clearly located at termini or en route will be considered as definitely part of the overall system; second, sites within field area of tracks; and third, sites in a *c.* 5km diameter outside the field area. While some degree of confidence can be attached to the physical connections of the first group of sites, it must be stressed that only the ceramic dates of the remaining two groups of sites can indicate contemporary use. The catchment area of the third group may appear somewhat arbitrary but is intended provide a backdrop of sites within the same geographical area.

### Tracks

The tracks are usually delineated on each side by low field walls (*c.* 0.50–1m wide) that occasionally can be up to 1m in height. The track widths can vary between 3 to 6m. Many tracks have been roughly paved with basalt or limestone blocks (Figure 133, page 471). They

clearly have been formed organically and follow contour lines, terrace outcrops or wadi lines. On the east and north sides of this area the tracks dwindle into dirt tracks that lead into hilly areas or south to the Ifjeij plain, thus the track lines are usually situated within the basalt volcanic area.

The lines of track were plotted using a GPS and individually described with the following numbers: DAS 351, 352, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 367, 370, 398, 408. These lines are shown as Xs in Figure 132 (page 470) in relation to the rest of the archaeological sites and the *via nova Traiana*. As it was clear that the plotted tracks followed track lines transcribed on the 1:50,000 maps (Shaubak Series K737, Sheet 3151 III), all the tracks shown on this map in the general area are shown in Figure 132 as dotted lines. It is probable that as the original photos for the aerial interpretation were taken in the 1950s, the transcribed maps show a greater area of ancient track use (Figure 133, page 471). In fact, the area was intensively developed only after the 1960s when people from the village of Dana settled there to take advantage of the newly constructed road and improved water and electricity links.

The area has predominately *terra rosa* soils with black volcanic basalt strewn over the earth. These stones usually make up the construction of the tracks and field walls. The amount of stone clearance is immense as large, predominately basalt, stone piles are evident to the north of track DAS 360. Some track walls contained extremely large boulders. In particular, track DAS 360 contained large blocks forming a wall 2m high and over 3.5m wide (Figure 134, page 472). Kennedy had already described this wall line in his aerial identification and preliminary field survey for the Gharandal Archaeological Project headed by A. Walmsley (Kennedy 1998, 579–582). Kennedy and Walmsley had concluded that the wall, due to its size and shape (evident as an L-shape on the aerial photo in Kennedy 1998), formed the external front of a fort. A built gap in the middle of the main large wall was considered to be a main gate.

However, there was no indication of the northern, western and north-eastern segments of this structure. Given the massive nature of the main wall, it is hard to rationalise the destruction of these wall sections for subsequent fields. Additionally, aside from stone clearance cairns, there was no indication of internal structures or a denser artefact presence (This last observation was not quantified in the field but based on a visual impression). Thus the interpretation of DAS 360 as a fort by Kennedy is incorrect following the elucidation of the surrounding field systems by DAS. In this regard, the misinterpretation by Kennedy and

Walmsley of DAS 360 serves to highlight the value of a broad landscape approach that eschews a narrow focus on site morphology.

The *via nova Traiana* (DAS 115), which was fully described in Chapter 6, runs north–south and perpendicular through this field system. It creates junctions with the following tracks: DAS 360, 398, 355, 356, 354, possibly 351, 364 and 365. It is hard to ascertain the relationship of the road to the tracks. Most tracks continue either side of the *via nova Traiana*. One track, DAS 354, clearly stops on the western side of the *via nova Traiana* and does not continue. In this instance there is no indication that it has been truncated. At the junction of the *via nova Traiana* with tracks DAS 364 and DAS 365 is the site of DAS 114, Shajarat Et Tiyara (see Figure 132, page 470). This site has been interpreted as a road station but, as can be seen from the plan, does not directly abut the *via nova Traiana,* unlike similar sites DAS 112 and DAS 353 further to the north. As the site is not fully aligned with the road it may have been built earlier. Given that tracks DAS 364 and DAS 365 clearly head for this site (Figure 132, page 470), it may be argued that the *via nova Traiana* was built after the site, hence the tracks. However, if the *via nova Traiana* is formed on an earlier Nabataean road (as was argued in Chapter 6), the Roman construction would not necessarily alter the pattern or form of the field system.

### Sites connected with track system

The following sites constitute the first group of sites physically associated with the track system (see Figure 132, page 470 for locations): DAS 1, 111, 112, 113, 114, 135, 346, 347, 353, 366, 380, 397, 399. All except DAS 380 produced ceramic dating samples and the results are listed in Table 67 (page 473). Sites DAS 111, 399, 366, 397, 399 are settlements and farms. Sites DAS 353, 112, 114 and 135 are road stations on the *via nova Traiana*. DAS 114 is also associated with tracks DAS 364 and DAS 365. DAS 113, Qasr Selim, is related to tracks DAS 351 and DAS 352 by field walls that respect the track lines. DAS 346 and DAS 347 are also associated in a similar manner. DAS 1, Khirbat El Bir and DAS 380, Khirbat Khirbat Abu Al Ajaj are probably at the termini of several tracks, DAS 363, 355 and 358, although the modern development of Al Qadisiya has damaged any true physical relationship.

The ceramic dates for these sites, as tabulated in Table 67 (page 473), demonstrate the overwhelming Classical period use within this system. Although two sites (DAS 1 and DAS 366) have Iron Age dates, it is clear that most of the sites (9/12) were first in use sometime during the Nabataean period. Such a broad initial occupation of sites associated with these tracks points to a Nabataean foundation for the field systems. While the ceramic use of sites

varies throughout the Classical period, it is noteworthy that the same numbers of sites were in use during the later Byzantine period (9/12). The cessation of site occupation during the Late Byzantine to Early Islamic period is dramatic – only two sites continue (DAS 113 and 135). This is more notable as both sites are road stations on the line of the *via nova Traiana*.

### Central villa?

To the west of these fields situated on the Plateau edge is a massive single structure, DAS 1, Khirbat El Bir, (Figure 135, page 474) which has several clear tracks (DAS 351, 355 and 358) leading towards it. The ceramic dates for the site run continuously from the Iron Age to the Byzantine period with a later Middle/Late Islamic sample. However, a Ptolemy II tetradachma (Figure 136, page 475) was also retrieved. The site is of a massive construction and has been altered through several phases of use. Also known as Khirbat Nana, it is a large, roughly rectangular (100 x 70m) site on the edge of the Plateau with excellent views to the east and south. The external walls survive to five/six courses (*c.* 1–1.80m) and are about *c.* 0.80m wide. It is now engulfed by the modern village of Al Qadisiya, which has destroyed much of the archaeological remains around the site (Findlater 2002, 143).

As can be seen from the plan (Figure 135, page 474), there are two distinct building phases. It is unclear whether the south-west area of the site was an addition/reconstruction or the original building to which the rest was later added. The architecture of this western area is characterised by the use of larger cut blocks than those used in the other area. Several modern buildings have been incorporated into the western part of this structure that further obscure the plan. The internal plan of this area shows it to be one of small rectangular divisions but no overall plan is discernible. However, it is clear that the rest of the site represents a unitary structure with a regular plan. On the north, south and east sides there are long, rectangular sections (about 20m wide) with entrances at either end of the block that contain double rows of rooms. There are three main entrances to this section: one on the west and two on the eastern side. One further entrance was noted on the southern side gaining access to another section of the building. These entrances lead into a large open area.

The size and plan of the structure is unusual within the project area. At first, the size of the building, which is comparable to the large fort of Dajaniyah (DAS 200), and its prominent position, suggests that it could have had a military function. However, the plan of the building has no parallels in comparable Roman or Nabataean military sites in the area (*cf.* Parker 1986a; Kennedy & Riley 1990; Kennedy 2000; Gregory 1997). The lack of towers and the arrangement of the entrances do not fit within the highly patterned tradition of Roman forts. However, one should note the lack of comparable data for earlier Nabataean

military structures (Kennedy 2000, 24). Furthermore, while smaller forts (such as Bir Madhkur or Qasr Tlah, see Chapter 4) are arranged around a large courtyard, this does not seem to have been followed in larger military structures in this area. It would be tempting to postulate a villa interpretation but the lack of local parallels presents some difficulties.

### Settlements

Immediately to the north of Khirbat El Bir there was once a site called Khirbat Abu Al Ajaj (DAS 380). The site is located on the 1:50,000 Shaubak (3151 III) map and older villagers remember the remains. A few obviously ancient walls exist between some modern buildings. However, the site has now been almost completely obliterated by the modern village of Al Qadisiya. The scale and nature of the site is unclear and earlier surveyors have not reported on it. Glueck's (1934, 1935) account of his passage through this area does not mention it although he may have conflated his account of Khirbat El Bir (above) with this site. It was assumed by DAS that this could be a nearby settlement centre.

One point seven kilometres to the south-east of DAS 1 and DAS 380 is another large, probable settlement site. DAS 111, Khirbat Sumra or Khirbat Hematah, lies immediately adjacent to track DAS 351 and is about 100m west of the *via nova Traiana* (Figure 132, page 470). Occupying an area 100 x 150m, the buildings seem to have been laid out in a systematic plan (Figure 108, page 434). It is clearly linked into the track systems with one track leading off to the east towards DAS 351 and one that extends from the south-east corner of the sites and probably heads for track DAS 408. The construction of the buildings is large and composed of sizeable, partially dressed blocks. A probable tower is located on the eastern side of the site. The southern half of the site seems to contain a distinct set of buildings containing regular-sized rooms.

### Farmsteads

Eight hundred metres south-east of DAS 111 lies the site of DAS 113, Qasr Selim (Figure 137, page 476). This site lies in an area of agricultural wall lines that respect the site and between two main tracks DAS 352 and DAS 351, that lie to the south and north of the site. The main site is a long, rectangular structure about 50 x 80m and consists of a series of rooms around a courtyard. The size of wall construction is large, 0.80m wide, and the walls still survive to 1.80m in height. 1.7km to the south of DAS 113 is another large farmstead, DAS 346. DAS 346 lies on a shallow spur that links to some tracks (probably DAS 352) by field walls that respect both sets of features. Covering an area 40 x 30m, the main structure is composed of rectangular units that have clearly been added to over time. The wall

construction is of large, roughly-hewn limestone blocks forming walls *c.* 0.60–1.00 wide. It is surrounded by field walls and enclosures.

The only other farm that is linked to the track system is DAS 366. This is located to the north of DAS 346 and DAS 113 and lies adjacent to track DAS 361. It is a roughly square structure (*c.* 37 x 38m) with some indication of internal divisions. The external walls are about 1.10 wide and still survive to two courses. There is no overall plan to the internal walls but most seem to be located around the edge of the building and a courtyard layout is envisaged. To the east of the building abut several large enclosures and a possible cistern.

### Single structures

DAS 347 is a small structure built on the slope of a hill 100m to the east of DAS 346. It links by field walls to a series of structures and stone cairns around sites DAS 350 and DAS 349. The site itself is a small single building (5 x 5m) that has a 15 x 14m enclosure 2m to the south. DAS 397 is a series of rectangular single structures with associated enclosures set immediately to the north of track DAS 365. DAS 399 is larger single structure (11 x 12?m) set to the south of track DAS 398. A series of field walls extends from the site to the south.

### *via nova Traiana* road stations

The following four sites are all set adjacent to the *via nova Traiana*: DAS 135; DAS 114, Shajarat Et Tiyara; DAS 112; and DAS 353, Khirbat Samra, have all been interpreted as road stations and were discussed in Chapter 6. Their respective locations and dates were discussed above in relation to the overall track system.

## Sites within track area

The following sites constitute the second group of sites that are within the area of surveyed tracks but which have no direct physical association: DAS 117, 119, 167, 348, 349, 350, 368, 369 (see Figure 132, page 470 for locations). Only three sites produced ceramic dates: DAS 117, 368 and 369 (Table 68, page 477). Unfortunately, only three of the eight sampled sites produced ceramic dates. As can be seen from Table 68 (page 477) the ceramic use of sites lies clearly within the Classical period. The lack of Early Islamic period ceramics follows the pattern of the first group but the sample size is small. DAS 349 and DAS 350 are within field systems to the south of the area and are in areas of large stone clearance. DAS 348 is a cave structure situated on the south-east side of a knoll to the south of DAS 346. DAS 368 and DAS 369 are farm structures located 20m apart, on the south-eastern face of a hill on the east side of the field systems. DAS 167 is a large circular enclosure that lies 25m to the east of

the *via nova Traiana* and between tracks DAS 398 and DAS 361. DAS 117, Ain Al Tariq, lies at the southern base of a hill overlooking the field system to the south. DAS 119, Khirbat Injasah, is situated on the outskirts of the modern village of Al Qadisiya and is heavily terraced into the side of a west-facing hill. While the lack of dating evidence hinders a complete correlation of these sites in the field system, an analysis of their site plans or topographic context may explain their overall significance.

### Farmsteads

The following two sites represent the largest structures contained within this group. Both are interpreted as farmsteads. DAS 368 and DAS 369 are both situated on the south-east slope of a hill 30m apart and exhibit similar characteristics. Both are large rectangular structures (DAS 368, 24 x 17m; DAS 369, 29 x 28m) built around a courtyard that seems to contain a cave/cistern. Both structures have towers incorporated in their northern faces. Both buildings are built with well-drafted limestone blocks. The tower of DAS 368 is built of blocks that are embossed. In most circumstances the individual location of such a site would merit the interpretation of a farmstead. However, the short distance between both sites is unusual, which again serves to highlight the distinct nature of sites within this track system.

### Miscellaneous structures

DAS 117, Ain Al Tariq, lies just to the north of the main area near a modern track that probably overlies an older one. While the name suggests a spring, modern water drilling has damaged the site. It is an area (50 x 30m) of poorly preserved walls that may form possible structures. DAS 119, Khirbat Injasah, is a large structure (24 x 20m) located on the north-west edge of Al Qadisiya. It is constructed of large limestone blocks forming walls 1m wide. It is heavily terraced into the hillside by a 2m high (20m long) wall. A series of large caves runs along the northern terrace of the site.

The following three sites are within the southern area of the track system around the large farmstead of DAS 346. DAS 348 is a cave with a blocked entrance. Various field walls (some of modern construction) and an enclosure are placed near the entrance. DAS 349 is a series of small structures set along a north–south ridge between two wadi systems. Some of the structures may be well-built field clearance cairns. DAS 350 is an enclosure (16 x 12m) containing a cistern that apparently feeds out into an area down a slope to the north-east. Two walls extending from the enclosure form a fan-shaped deflection system. To the south of these walls, near the wadi base, are two massive stretches of field clearance. One is about 90m long and 1m high while the second is over 30m long, 9m wide and 2m high. These

clearance piles demonstrate the massive investment needed to make this area suitable for agricultural use.

The only other feature contained within the track system area is a massive circular (*c.* 800m in diameter) enclosure, DAS 167. The site is located within an area bounded by tracks DAS 398 and DAS 361 and the *via nova Traiana*. However, there is no physical relationship between any of these features. The enclosure has been sub-divided and is formed by walls 2m wide. It is large enough to be marked on the 1:50,000 map and was noted by Kennedy (1998, 579). The closest comparisons to it are the large enclosures found on the Desert route discussed in Chapter 6. These are clearly associated with the movement of large flocks of animals. Thus, DAS 167 may be functionally related to the *via nova Traiana* road system rather than being part of the track system.

### Sites immediately outside track area

The following sites constitute the last group located on the fringes of the field system: DAS 2, 3, 7, 85, 101, 116, 118, 162, 232, 233, 239, 371 (Figure 132, page 470). They all lie within an arbitrary 5km area of the main track area. All except DAS 2, 3 and 7 produced ceramic dates that are summarised in Table 69 (Page 477). DAS 232, Khirbat Hudeira, and DAS 233, Umm Huweitat, are settlements situated on the range of hills to the east of the field system. DAS 162, Khirbat Aqyra, is another settlement located several kilometres to the north of the field system adjacent to the *via nova Traiana*. DAS 118 is a tower and settlement site on an eastern lower spur of Jabal At'aita. DAS 116, Rujm Ras El Hala, a tower site, and DAS 239, an adjacent farmstead, are located on the top of this hill. Das 371, Khirbat Wadi Dhulma, is a farmstead situated on an upper terrace of wadi between Jabal Ata'ita and Al Qadisiya. DAS 3, Khirbat Ata'ita, a small structure, is situated next to the modern road on the northern outskirts of Al Qadisiya. DAS 2, Khirbat El Alimeh, is located on the edge of the Plateau overlooking the village of Dana and Wadi Dana. DAS 7 is the modern village of Dana that is located on a lower open terrace just under the main Plateau edge. DAS 101, Khirbat En Nawatif, is set within an extensive area called the Barra that is just to the west of Al Qadisiya. DAS 85 is located on a hill overlooking the Wadi Dana. There are several smaller sites around DAS 85 but they have not been included in this discussion as they are small enclosure features, lacking any date.

The ceramic dates for these sites are tabulated in Table 69 (page 477). Earlier surveyors had sampled three sites. DAS 116 had already been sampled by Glueck in the 1930s. He notes Iron Age and Nabataean sherds, the latter of which he assigned to a nearby settlement (Glueck 1935, 96). This last observation by Glueck may relate to DAS 239. DAS 232,

Khirbat Hudeira, was sampled by Hart (Hart & Falkner 1985, 270) who listed sherds from the Middle to Late Islamic period. DAS 2 and DAS 3 could not be sampled at the time due to local conditions. DAS 7, Dana village, had been sampled by Glueck who reported only a few medieval sherds (Glueck 1934, 78). The present survey did not sample the area as the only sherds noted were down the slope (along the track to Wadi Dana) from the village and the context was unclear.

Again the ceramics denote an overwhelming Classical use of the sites. However, one should note that DAS 116 produced no Iron Age ceramics but Glueck had reported the presence of Iron Age types in 1935 (Glueck 1935, 96). The same may apply to the adjacent site of DAS 239. The only sites to continue into the Early Islamic period are DAS 118, 162 and 232, which have all been interpreted as settlement sites. The phenomenon of greater continuity of settlement sites into the Early Islamic Period, compared with the fall in other site types, has already been noted in Chapter 7. Within the context of this chapter, this phenomenon serves to highlight the probable economic changes during this period when apparently specialised land use areas (or at least the sites associated with them) went out of use and only village sites continued.

### Temple

Located to the west of Khirbat El Bir, on a wooded plateau area overlooking the Wadi Dana, is a probable temple site, DAS 85, (Figure 138, page 478) dating to the later Nabataean and Roman periods. A relatively small site (25 x 15m), it was built of large limestone blocks. Four fragments of pillars were found within the rubble debris. A couple of smaller structures abutted the north and south walls. A 5m wide podium may be interpreted at the western end of the structure. A small tomb (DAS 86) is located just to the south, carved into the limestone rock (Findlater 2002, 143). The site is orientated north-west–south-east which would present a dramatic view of the sunset across the hills of the Negev. The discovery of this type of site is unusual in the area (Villeneuve 1992, 285–287 & Fig. 8) but is within a tradition of Nabataean temples located in high places (see McKenzie *et al* 2002).

### Settlements

The following settlement sites are within 5km of the field system and, while there is no physical contact with this system, some degree of relationship may be assumed: DAS 7, Dana; DAS 101, Khirbat En Nawatif; DAS 118, Khirbat Farjiyah; DAS 162, Khirbat Aqrya or Khirbat Al Ameriah; DAS 232, Khirbat Hudeira and DAS 233, Umm Huweitat. DAS 233, 232, 101 and 7 are clearly settlement sites with more or less similar sized buildings close to

springs.They have been included to provide a kind of rural background to the clearly associated set of monuments discussed in the two previous sections. DAS 7, Dana, and DAS 233, Hudeira, are still in use today, although the latter seems to have been more seasonally occupied. No secure dating samples were taken from Dana. The present village was begun in the nineteenth century. A lintel with a Byzantine cross was noted built into a house but there was little other data to support an earlier date.

However, although DAS 162, Khirbat Aqyra, and DAS 118, Khirbat Farjiyah, have both been classed as settlements, they both contain structures that may suggest other functional interpretations. Khirbat Aqyra is situated *c.* 300m east of the *via nova Traiana* and covers an area 150 x 100m. At its western edge is a well-built substantial structure (18 x 30m) with a tower at the north-east corner. Smaller, less well-built structures surround this larger building and extend for about 100m to the north-east. Thus it is possible that it may be a large farmstead with attendant buildings. Similarly, Khirbat Farjiyah has at its centre a well-built tower (8 x 7m) constructed of embossed blocks.

### Farmsteads

DAS 239 is a single structure (20 x 6m) set 40m north of a large tower, DAS 116, Rujm Ras El Hala. DAS 239 is divided into two partitions and is surrounded by field walls and enclosures. Although more properly classed as a single structure under the DAS classification system, the position of this site, in an area of field walls and separate from all sites (bar the tower), suggested a farm. However, DAS 371, Khirbat Wadi Dhulma, is clearly a farmstead of some size. The main building measures about 60 x 80m and, though indistinct, the internal plan was quite complex. A large grinder (1.30m in diameter) was found in the north-east corner, which also suggests a processing function. Numerous enclosures and field walls surrounded the site on its north, west and east sides. On its south side and extending downslope is series of small structures.

### Tower

As was noted above, DAS 116 is 40m away from farmstead DAS 239. DAS 116, Rujm Ras El Hala, has in the past been seen by Hart (Hart & Falkner 1985, 270 Site 111 or 112) and Glueck (1935, 95–96,136 (Site 184); 1939, 21, 24 (Site 31)) as a major tower in the Iron Age settlement pattern. However, DAS has shown that it had occupation during the Classical period. While it is improbable that it had a military function during the Classical (certainly Roman) period, it may be linked with the farmstead DAS 239 as many farmsteads incorporated towers in their construction. Unfortunately, DAS 2, Khirbat El Alimeh, could

not be surveyed during the project as it is used by the Jordanian Army as an observation post overlooking the Wadi Dana. Its military use was discussed in Chapter 6 but it is clear from Glueck's survey (1934, 75 & 77) that there was Nabataean/Early Roman pottery on the site.

### Structure

DAS 3, Khirbat Ata'ita consists of two single rectilinear structures set on a ridge at the northern end of modern Al Qadisiya. Both structures measure 10 x 15m. The expansion of the village has destroyed the immediate context of the site and so its function is unclear.

## Discussion

The accumulated evidence presented in this section points to a sustained and integrated pattern of sites throughout the Classical period. The interrelationship of sites and tracks with fields through which the *via nova Traiana* runs is a clear sign of a well-managed landscape that does not occur elsewhere in the DAS area. The connection of this landscape with the large site of Khirbat El Bir is uncertain but the uniformity of ceramic evidence from the sites suggests a broad contemporary pattern. The relationship with the temple DAS 85 is, of course, impossible to ascertain, although it too existed throughout the Nabataean to Byzantine period (Findlater 2002, 144).

However, it is argued here that the association of these sites and features, which suggests a large, managed area of interlinked features, coupled with the information from texts, is highly persuasive. All these features suggest that we may have the setting of the imperial estate, Σαλτων ίερατιχου (Salton Hiertikon), referred to by George of Cyprus (Honigmann 1939, 43–44). The proximity of these sites to the metal resources in the Faynan area should also be noted (Findlater 2002, 144).

If the sites around modern Al Qadisiya are seen as part of the imperial estate (DAS 381), the location of several forts, noted in Chapter 6 (Khirbat Qannas, DAS 193; Khirbat Dajaniyah, DAS 200; and Khirbat Samra, DAS 160), contemporary and within the area, tends to suggest a link with defence and estates as Graf (1997a, 131) has suggested for other areas in Jordan and Syria. Although this study has been critical of the defensive military system as envisaged in a *limes* system, it does not deny that the location of sites like Dajaniyah reflect defensive needs. However, it is argued that the reason for their location has more to do with the position of resources than considerations of military defence (Findlater 2002, 143).

It is difficult to phase the development of these three sites, but it is noticeable that DAS 160 was not occupied during the Late Roman and Early Byzantine period. Clearly DAS 193,

Khirbat Qannas, was occupied at this period but its status changed when the *caravanserai*-type building was added. DAS 200, Khirbat Dajaniyah, seems to have been constructed around AD 300 and carried on to the fifth century. It is proposed here that DAS 193 and DAS 160 may have been contemporary, but around AD 300, as Dajaniyah was built, Qannas (DAS 193) was turned into a *caravanserai* and DAS 160 ceased to operate until the later Byzantine period. At the same time, a clear material infrastructure was put in place along the Desert Highway route. While the shift of military sites further east is clearly related to the monitoring of the desert route, it is argued here that the size of the Dajaniyah fort also relates to the presence of an imperial estate.

## Conclusion

While scholars, such as Isaac (1992, 119–123, 199–206) and Graf (1997a, 1997b), stress the importance of communication routes, they do so in a model of how these roads served the forts of the area. This in a sense echoes Parker's view of forts in the landscape as consumers of local resources (see Chapter 2). However, the review and presentation of textual and archaeological evidence in this chapter demonstrates evolving fort location matching changes made in road and local resource patterns. The overall review of imperial estates and large material resources clearly correlates such resources with military location. The review of the historical evidence points to the existence of these resources long before the Romans annexed the area. Therefore one can argue that the location of forts was not determined by provincial security or defensive systems but by the presence of resources directly exploited by the imperial government. It is clear that many of the sites in the Wadi Arabah spatially correlate with mineral or salt resources. However, there are also imperial estates around Safi. This pattern is clear in the Negev where the presence of large imperial estates again correlates with military locations.

In this regard, Parker's assumption "that the deployment of military assets reflects perceived notions of threats to Roman rule in the region" (Parker 1995, 116) is only partially correct. It is correct to assume that military assets were located to combat threats against imperial interests. However, the accumulated data of this study undeniably shows that the perceived threat to Roman rule centred on the control of very specific communication routes. The threat may be Parker's nomads or Isaac's bandits but the deployment had little to do with a strategic intent to combat this threat. The relatively large size of the main forts along the desert route is no testament to the threat of the forces ranged against them, but to the importance attached to the route as a strategic supply highway. The deployment of troops in

*Palaestina Tertia* was part of a massive resourcing system on a geographical scale beyond the models of imperial control offered by Parker, Isaac or Graf.

This means that one cannot now prioritise any one of these military roads over the others, or speak of lines of defence or centres of internal security. The evidence from Chapter 3 shows that garrisons were placed in all three provinces of *Palaestina*. As most of the troops in Jordan and Palestine were based on routes that were primarily designed to monitor, supply or move material on a vast scale, the contention of a military frontier in southern Jordan is nō longer tenable.

However, while the overall textual and archaeological dataset points to clear associations with imperial resource units, the archaeological corroboration for this is weak. Scholars have been content to note the existence of such units but investigation on the ground is lacking. In many cases it usually involves the search for villas. This approach emphasises specific site morphology over a wider understanding of these units in the landscape. This limited approach has serious consequences for the study of estates in the Roman period. The sites of Al Hammam and Al Mutrab near Ma'an have long been associated with military function but have also been recognised as being in an area of irrigation or major land use. Thus, in this instance the correlation of military function and local resources seems clear. However, a landscape survey of the area by DAS demonstrated a large integrated irrigation unit of Late Byzantine and Early Islamic date. The existence of this system clearly shows the wealth of the area in a period of supposed decline following the breakdown of Roman rule. However, these sites cannot be used in any meaningful reconstruction of military sites and local resources.

Nevertheless, to the north of Ma'an the DAS project was able to confirm the existence of an imperial estate around the Dana area, which may have been the *Salton Hieratikon* referred to by George of Cyprus. It is the first time, in Jordan, that the material correlates of such an estate have been elucidated, and this has been achieved by employing a broader conception of survey evidence. The existence of three large forts close to this area suggests a clear association of military location with resource management throughout most of the period of Roman rule. The eastward movement of these forts to monitor a major new desert route further confirms this theory. As has been repeatedly emphasised in this study, the Roman pattern of sites lies within a much deeper tradition of similar landscape use in the area. Thus, military location was predetermined by resource position, which subordinates forts in an overall imperial system for *Arabia* as being purely located to control and secure provincial resources.

# Chapter 9

## A new interpretation of the imperial landscape

### Introduction

The aim of this study was to provide a more balanced model for the interpretation of Roman imperial military activity in southern Jordan. In the process, it also sought to establish a more dynamic role for the use of archaeological data to counter the dominant historical framework that hinders Roman frontier studies in Jordan. Indeed, throughout this study great emphasis has been placed on the different standards of validation required for the effective use of historical and archaeological data. As a result, much of the evidence presented has been used to eliminate many of the misconceptions about previous models and interpretations of Roman imperial control.

The three main areas of investigation of this study were: to identify the origins and impetus that led to the development of the Roman system of forts; to describe the range of this system through time; and to trace this system through space. The results are summarised in the first part of this chapter. Next, drawing on the new data presented in this study, the terms *limes* and *limitanei* are reinterpreted, providing an answer to the central question of the existence of a unified Roman military strategy. The chapter ends with an appreciation of possible further avenues of research in light of this study's conclusions.

### The development of the Roman system of forts

The accumulated data presented in this study demonstrates a sustained and highly regular pattern of imperial military activity over the 500-year span of Roman rule. However, it is not the military *limes* system that Parker (1986a) outlined as a linear defensive system. Although he was right to base it on the Roman use of the term *limes*, this study has demonstrated that a line of defence along the desert fringes of Jordan was never a clear Roman strategic aim. Moreover, while the threat of nomads may have had some bearing on the size of military deployment, it had nothing to do with the creation of the system (Parker 1995). Similarly, wider internal security problems in the provinces did not occasion permanent military deployment (Isaac 1992, 1998, 122–158), and were of less importance than the security of the main military roads. In scale and breadth of system, Fiema's (1991) hypothesis for the correlation of long-distance trade and military location was more imaginative than the tightly focussed models of Parker, Graf and Isaac. However, Fiema's model is too broad and failed

to correlate the true structural linkages between military location and the wider socio-economic landscape.

This study focussed on the spatial and temporal patterns of resource areas, routes and military sites as the material structural links between the Roman military and the wider socio-economic framework. Through this infrastructure of forts, roads and estates, the Imperial House controlled areas of exploitation and ensured that these resources were safely transported along monitored military routes to imperial industrial sites or direct to strategic military areas. This form of Roman imperial system is partly based on Luttwak's (1979) model of Roman imperialism where he discerns an overall change in Roman methods from the republican and early Principate methods of hegemonic control to the direct territorial control of the later Empire. As Luttwak showed, this would have entailed a greater engagement with local resources in the frontier areas. However, while Luttwak maintained that most of the military installations in the southern Negev and Jordan were primarily linked to defensive installations as part of a wider imperial strategic programme, this study has shown that they are part of a wider resourcing system.

This is not to argue that all military movements on the Eastern Frontier were linked to this system. As was argued in Chapter 3, the transfer of the *X Fretensis* to Aqaba from Jerusalem around the beginning of the fourth century, was probably due to the expansion of the Sassanid Empire under Shapur II, and the expansion of the states of southern Arabia. However, these specific historical events had little overall impact on the nature and scale of the resourcing system. What began as a system to provide the materials to maintain a small Hellenistic Kingdom was almost completely assimilated into a world Empire that integrated all the resources and materials of the ancient Near East into one massive system.

### The Roman system through time

In this study the relationship between Roman military sites and specific resources points to a vast resourcing system that was maintained throughout the whole period of Roman rule. In archaeological terms this system has survived as sites of military activity which are located around resource areas or distributed along routes. However, one cannot elucidate every historical stage of this system. The archaeological and textual evidence presented in the preceding chapters successively built up strong patterns of constant human behaviour. The same routes and the same locations were continually associated with state monitoring or control. The primary data presented in this study clearly demonstrates not only the scale of the Roman system, but also its roots in older patterns of state activity. The tracing of military routes in Chapter 6 nearly always pointed towards a Nabataean foundation for the material

infrastructure along main routes. The evidence presented in Chapter 7 illustrated the depth of continuity in the landscape since the Iron Age period. Moreover, the demonstration of a large-scale imperial estate in Chapter 8, although clearly associated with Roman period fortifications and road systems, was rooted in a Nabataean agricultural and religious landscape. Thus, the Roman imperial landscape was rooted in a Hellenistic or, more specifically, a Nabataean model of state activity and settlement processes. However, the Romans linked these existing routes, estates and forts into a much larger and integrated system across the whole eastern frontier.

Where change occurred it could be clearly associated with specific phases of reform or stress on the system. The establishment of a desert route with larger forts on the desert fringe can be dated to the Diocletianic reforms of the Late Roman period. However, the archaeological evidence from Jordan shows that these roads were not purely Late Roman establishments but were based on earlier Nabataean patterns. Moreover, the Romans had continually based their troops on these roads since the inception of the province. Thus, Diocletian's great reforms have to be put in this longer time-scale. A Tetrarchic inscription (Roll 1989) found in the fort at Yotvata (see Chapter 4) in the Wadi Arabah proclaimed the establishment of a military unit there. However, the textual reviews in Chapter 3 clearly showed that the site had appeared on road lists since the beginning of the province. Thus, one should note the propagandistic tone of this type of textual data.

While scholars, such as Parker (1986a) and Fiema (1991), posit a military/political collapse in the Late Byzantine period to account for the rapid overthrow of the state by Muslim tribes, it is clear from the textual evidence of Chapter 3, and the archaeological review of sites in Chapter 4, that there was no wholesale collapse of any imperial structural system. During the Early and Late Byzantine period political control of the military system passed from the state to local tribal confederations. This transfer of power probably resulted in the growth of major settlements and estates (such as noted in Chapter 8) on the fringe of the Jordanian Plateau areas around Ma'an etc., which have been wrongly attributed to Roman colonial settlement policy. However, it is clear that that the military and wider socio-economic systems functioned until the Sassanid invasions and later Muslim take-over of southern Jordan. As Chapter 7 demonstrated, strong settlement continuity into the Early Islamic period confirmed the lack of structural linkage between the military system and wider settlement patterns.

### The Roman system through space

While earlier scholars emphasised the correlation of military location with specific tactical requirements, this study has shown the strong association of military location with a range of

natural and managed resources such as the specific topographical details of proximity to water, a strong position on a hill etc. Though clearly important, these local associations were not determining factors in the choice of military location. The determining factor, demonstrated in Chapters 4 and 6, was the proximity of mineral resources throughout the whole of the Wadi Arabah. Thus, the location of the major fort of Khirbat Dajaniyah was not designed, as Kennedy (2000, 162) argued, "to patrol and police the steppe and protect the settlements of the Jebel Da'ajaniya area" but, as was shown in Chapter 6, to patrol the major desert road that was upgraded in the Later Roman period. This route, as was shown in Chapter 8, was probably designed to move materials up to the military factories (the *fabricae*) in Damascus and beyond. Finally, the fort also protected an imperial estate centred near modern Al Qadisiyah, which probably controlled the copper production in the Wadi Faynan.

The correlation of military locations with certain routes and their association with natural resources meant that the spatial military variation during the Roman period was very conservative. Within southern Jordan, the only area of expansion was the establishment of a desert road. Sites like Udhruh, Khirbat Dajaniyah and Lejjun controlled this route which broadly followed the road now termed the Desert Highway. The correlation of these forts with a major route that led up to Damascus and on through Syria (as the modern Desert Highway now does), demonstrates that the spatial variation of military location was linked to a massive landscape use across the whole of the Eastern Frontier.

### *Limes* reconsidered

While this evidence has served to clarify the debate, does it provide an adequate answer to the main question of this study: was there a unified historical aim in the military strategy of the Roman Empire? While it was not the aim of this study to provide a meaningful narrative explanation of this question, several key factors within the historical treatment of Roman military systems can now be addressed which, it is argued, provide a resolution to the main question. These are: a reconsideration of the term *limes* and a reinterpretation of the term *limitanei* as frontier troops.

The view that the main Roman routes of southern Jordan primarily acted as a resourcing system for the region calls into question the use of the term *limes* as used by both Parker and Isaac. The importance of this term in Roman frontier studies has been seen as crucial to the definition (or not) of a distinct military system. Parker (1986a), for all periods, follows the traditional definition of *limes* as a road transverse to enemy territory and by extension a frontier road/defence system. Isaac (1998, 345–389), while accepting that this meaning

existed in the early Principate, contends that in the later Empire it came to mean a broad zone or frontier area, devoid of any military significance. It is argued here that for the later Empire, especially post-Diocletian, both terms are wrong since they only partially represent the meaning of the term. However, as was noted in Chapter 2, the strength of later Roman references, such as the one by Ammianus noted below, suggested to Mommsen (1908, 456–464) a double line of frontier systems. This was seemingly confirmed by Brünnow and von Domaszewski's (1905) survey of the route that heads north from Ma'an.

*Quod Diocletianus exiguum antehoc et suspectum, murris turribusque circumcedit celsis, cum in ipsis barbarorum confiniis interiores limites ordinaret, .....per Syriam Persae, ita ut paucis ante annis cum magnis provinciarum damnis.* (Amm. Marc. 23.5.2)

But Diocletian, when he was organising defences in depth on our actual frontiers with the barbarians, surrounded it with walls and high towers,.... to prevent the Persians making inroads into Syria of the kind that had occurred some years before and inflicted great damage on our provinces.

The text is incomplete but it refers to a reorganisation by Diocletian of the *interiores limites* when, following the Persian raids into Syria, he strengthened the defences of Circesium (modern Buseire, see Pollard 2000, 292–293). However, there are three separate events here: the Persian raids; the strengthening of defences of a particular town and; a reorganisation of what Isaac terms the fourth-century and onwards' use of the term *limes* as a frontier district. This use of *limes* to mean a frontier district is echoed in the later Byzantine author Zosimus' description of Diocletian's achievements (Zosimus 34.1–2):

τής γάρ Ρωμαίων επικρατείας άπανταχού τών έσχατιων τή Διοκλητιανόυ προνοία κατα τόν είρημένον ήδη μοι τρόπον πολεσι καί φρουρίοις καί πύργοις ιελημμένης...

Thanks to the foresight of Diocletian...the *eschatia* of the empire were everywhere occupied by cities, forts and towers.

*Eschatia* (τών έσχατιων) means remote regions and links Diocletian's reforms to the defence of frontier areas. One should note the use of φρουρίοις, which is translated here as fort, but which usually means a fort on a road (Isaac 1992, 252, 256). Isaac terms both the above statements as "vague", asserting that "they do not tell us more than that Diocletian was responsible for the construction and manning of military institutions in the frontier areas. Zosimus exaggerates the merits of Diocletian's work [as] the frontier was never impenetrable" (Isaac 1992, 163). Isaac's statement is curious as it is obviously based on a modern opinion of the size of the frontier and the difficulty of defending it. Therefore, it is not a valid historical point to make about Zosimus' statement. However, both statements, far from being vague, clearly associate Diocletian with a major development of border infrastructure.

Another reference, which also mentions *limes* explicitly, has also been dismissed by Isaac as "vague" or "not straightforward" (Isaac 1998, 371). This comes in the work of the latter sixth-century Syrian chronicler John Malalas (Malalas 12.40 (308)):

Ἔκτισε δέ καί εις τά λίμιτα κάστρα ὁ αύτος Διοκλητιανός άπο τής Αίγύπτου έως τών Περσικών όρων. τάξας έν αύτοις στρατιώτας λιμιτανέους, προχειρισάμενος καί δούκα κατά έπαριαν ενδοτέρο τών κάστρων καθέζεσθαι μετά πολλής βοηθείας πρός παραφυλακήν. καί άνήνεγκαν τώ βασιλει καί τώ Καίσαρι στήλας έν τώ λιμίτω τής Συρίας.

Diocletian also built forts in the *limita* from Egypt to the border with Persia. He stationed there *limitanei* and appointed *duces* in each province for service in the forts to stand guard with a strong force. For the emperor and Caesar they erected stelae in the *limes* of Syria.

Van Berchem (1952, 17–18) has shown that stelae refers to the milestones of the *Strata Diocletiana,* the main road across the desert through Palmyra to the Euphrates. In another passage, Malalas (13 (295)) described the raid of Shapur I on Antioch through "the *limes* of Chalcis". Van Berchem concludes this refers to interior roads systems (van Berchem 1952, 5). However, Isaac goes further and claims it refers to the hinterland or steppe of Chalcis (Isaac 1998, 363). Isaac over-interprets the passage as the original meaning is clear in both passages. The term clearly still refers to a fortified road, not "specific districts where forts are built" (Isaac 1998, 362). Thus, when Ammianus Marcellinus speaks of Diocletian's reorganisation of the *interiores limites*, he probably refers to the same structural changes as happened in Syria and Jordan. This is not a strengthening of territorial defence systems but a massive redevelopment of major imperial communication routes.

The archaeological evidence presented in this study, of the desert road in southern Jordan and the very specific late third to early fourth-century construction of forts such as Dajaniyah, Lejjun, and Udhruh (see Chapters 4 and 6), clearly correlates with Malalas' descriptions. Moreover, the reorganisation of the *Strata Diocletiana* and the desert road discovered in Jordan, when linked with the routes across the Negev, is a very physical testament to Malalas' phrase "from Egypt to the border with Persia". Furthermore, if one accepts that *limes* in the later Empire still had the meaning of fortified roads, a passage from Ammianus Marcellinus (Amm. Marc.14.8.5) in the mid-fourth century, has a nearly contemporary echo of the massive scale of the development programme.

*Orientis vero limes in longem protentus et rectum ab Euphratis fluminis ripis ad usque supercilia porrigitur Nili, laeva Saracenis conterminians gentibus, dextra pelagi fragoribus patens...*

The limes of Oriens stretching from the banks of the Euphrates to the Nile, bordering on the left on the Saracens and to the right exposed to the waves of the sea...

The imagery is similar to that in earlier edicts describing the construction of the *via nova Traiana* (Thomsen 1917, 1):

*Redacta in formam provinciae Arabia viam ovam a finibus Syriae usque ad mare rubrum aperuit et stravit*

(Trajan) having organised Arabia as a province opened up and paved a new road from the boundary of Syria to the Red Sea.

Therefore, it is suggested in this study that the term *limes* still has the original connotation of a military road. In the Late Roman and Byzantine period such roads were not associated with a military border but were spread over provinces. Nevertheless, it is clear from the archaeological and historical evidence presented in Chapters 3 & 4 that these roads and the location of military forts were not new constructions but were rooted in far older state systems. What does appear to be new is a change in the concept of the term that may have linked roads, forts, estates, mineral resources and industrial centres over vast areas. The scale of this system certainly impressed contemporary and later writers, as the comments of Malalas and Ammianus Marcellinus above testify.

### *Limitanei*

The reinterpretation of *limes* offered here also casts doubt on previous views of the soldiers of the frontier area, the *limitanei*. Parker, following Mommsen (1908), sees them as a hereditary peasant militia (Parker 1986a, 10). Moreover, they are regularly seen as inferior to the parallel development of the main field armies from the Tetrarchic period onwards (Southern & Dixon 1996, 35–37). Isaac has clearly demonstrated, following Jones (1964, 649–653), that these troops were an integral specialised branch of the Roman Army that, in his view, policed the frontier districts in a variety of functions (Isaac 1998, 379).

*Limitanei* is a term first applied in AD 363 in a legal text assigning these troops to the command of the *duces* (*C.Th.* XII, 1, 56). However, one should note that Malalas, in the text cited above, uses the term in relation to Diocletian's reforms. Although this use of the term *limitanei* may be anachronistic, as there is little corroborative historical evidence that Diocletian founded specific troops with this name (Southern & Dixon 1996, 35–37), these troops are clearly linked to the *limita*, the frontier district, or, as argued here, a specific road system. However, Isaac argued that these frontier districts did not mean a defended frontier but a broad area throughout the province. He cited *CTh* VII, 4, 30 (23 March, AD 409) (=*C. Iust.* XII, 37, 13) to show that it referred to troops throughout provinces that were nowhere near a military frontier:

*Limitanei militis et possessorum utilitate conspecta per primam, secundam ac tertiam Palaestinam huiuscemodi norma processit...*

In view of the interests of soldiers of the frontier districts and of landowners in First, Second, and Third Palestine a ruling has been issued...

In his view, this demonstrated that the term was an administrative one and could not be applied to a territorial one (Isaac 1998, 379 also 1992, 208–213). The results of the toponymic interpretation of the *Notitia Dignitatum* and other documents in Chapter 3 clearly demonstrate that most military units were on major routes. While Isaac was no doubt correct to state the term was an administrative one, that does not preclude it being a term for a system of troops.

The new interpretation of *limes* offered here, in the context of the existence of a major integrated road network as a security system of imperial supply routes, suggests that *limitanei* were specialised soldiers whose first duty was to provide security for that supply system. The specific connection of these soldiers with a specialised road security system may be seen in some terms of reference for the commander of these troops – *the dux*. This official was the senior military commander in the frontier provinces of the East and was not part of the civilian government apparatus under the *praeses* (governor) of these provinces.

*Munderuch ducem postea limitis per Arabiam*

Amm. Marc. 31, 3.5

Munderich, later *dux* of the Arabian *limes*

Isaac notes that the use of *per*, meaning through, suggests that *limes* is spread over a province rather than denoting a line or edge (Isaac 1998, 360). Although the term is confused with or used popularly to mean frontier district, it is clear that it probably retains its original meaning as *dux* of the military roads through Arabia. This disassociates *limes* with any notions of a linear frontier but does hint at the broad system of lines of forts protecting a road network. This idea of protection is seen in the following text:

From *IGLS* V, 2704 from Khan El Abyad:

*Limitis ur[biu]mque fortissimae custus*

Most brave protector of cities and *limes* (*i.e.* the *dux Foenicis*)

Isaac (1998, 364) correctly noted that if *limes* referred to a system of fortifications, the term "protector of limes" makes no sense. Isaac's point is well made but he uses it to demonstrate that the term refers to a broad frontier zone with no connection to military defence. While the

term may mean an area of land (or frontier land), the probability is that it could refer quite precisely to military roads. In this instance, a "protector of *limes*" makes sense as it retains the association between a military feature and a military official.

The juxtaposition of cities and roads with a *dux* in this inscription is significant as Isaac notes that the seat (*praetoria*) of a governor was usually on a road or in a city (Isaac 1992, 172). Thus the definition of the fort at Qasr Bshir (Parker 1986a, 53–55; 1987b II 457–496) as a *castra praetorii*, when correlated with its location, is highly important. Isaac argued that the position of Qasr Bshir on a possible desert road (Isaac 1992, 173–174) denoted an administrative centre. However, Kennedy (2000, 142–143), who accepted Graf's (1997a, 1997b) view that there was no desert road, conjectures it was a point of contact for nomadic and local peoples. The archaeological evidence in Chapter 6 clearly demonstrates that a massive road network, and attendant fortifications such as Khirbat Dajaniyah, was established in the Later Roman period on the desert edge. The forts at Qatrana and Qasr Bshir no doubt were on this route. Thus, the presence of an official who oversaw road security as part of a vast integrated supply system may suggest a function for Qasr Bshir as an in-field command centre on a major military route.

This official oversaw specialised troops, *limitanei*, charged with the security (and maintenance, supply etc.) of a very specific imperial network of roads. This network of roads, when correlated with the archaeological and textual evidence of civilian settlements, imperial estates and military locations, demonstrates a pattern of landscape use on a vast scale. Moreover, the description of Munderich as the *dux* of the *limes* through *Arabia*, and the unnamed protector of *limes* suggests that the *limes* was regarded as a system. Thus one should reject Isaac's statement that *limes* "denotes an administrative concept.... unconnected with the military structures which may have existed in the area" (Isaac 1998, 408).

The treatment of these historical terms requires a more rigorous review before the above interpretations can be fully accepted. In particular, one would have to demonstrate precisely when *limes* begins to refer to a series of roads in the provinces and not just a road adjacent to enemy territory. However, it is becoming more apparent that *limes* should not be regarded as a system determined by military considerations, and it is the contention of this study that the origin of the system will be found not by looking solely at military notions of defence, but by looking at the wider exploitation of the socio-economic landscape.

## The Imperial Landscape: levels of interpretation

The above reinterpretation of contested terms is offered as possible evidence of a unified Roman military strategy. The archaeological evidence points to longstanding patterns of Roman control in the landscape over a 500-year period. This landscape was one that integrated previous Hellenistic systems of military and civilian sites, communication systems and resource areas into a massive imperial framework that covered the entire Roman eastern frontier. The Romans built up these earlier systems by expanding resource exploitation areas, adding larger forts, managing more efficient routes and centralising production in specific locations. The correlation of imperial estates, industrial centres and road networks is a clear indication of a vast system concerned solely with maintaining the military machine. In a political sense the imperial aim was precise. However, whether it was completely articulated or understood by one man or a body of people is a moot point. Nevertheless, the inscriptions and texts of the Tetrarchic period clearly point to a broader realisation of the imperial network at this time.

Whether one can historically articulate that realisation in every period has been hotly debated. The archaeological patterning of the material remains of the Roman Empire in southern Jordan is a more robust testament to a system of imperial control. However, the reinterpretation offered in this study is based on elements of archaeological evidence that were not apparent to Roman and Byzantine period observers. The next stage is to begin to reinterrogate the historical data for the discovery of these systems. As the rapid overview of the use of the term *limes* above shows, an exact correlation between the two datasets cannot be expected, but when both sets are used equally, a more imaginative and dynamic interpretation is possible.

These more imaginative analyses should be encouraged in future work and regarded as key elements in Roman frontier studies. All too often research in southern Jordan and Israel follows traditional academic boundaries, developing mutually exclusive methodologies for each dataset. Insufficient attention is paid to the linking process between the past dynamic of military activity and the present static archaeological data of sites, graves, epigraphic objects etc. Unfortunately, this is a feature of most studies of this period. It is usually argued that the wealth of textual material from the Roman Empire allows one to reconstruct past military dynamics and thus bypass this process in the archaeological record. Indeed, most previous research discussed in this study treats the literary and epigraphic data as the primary index of past dynamics to which the archaeological data can be referred and compared. Many of the

problems and contentious issues treated in this chapter have at their root this flawed approach.

Rather than inventing separate or unique methodologies to combine the archaeological and historical datasets, the correlation of both can be validated in what Hodder termed a "pattern playing inductive exercise" (Hodder 1987, 8). In his discussion of modern culture contact situations, Lightfoot characterises the use of textual sources as "revelations" rather than "analogues" for comparison with archaeological data (Lightfoot 1995, 211). In fact, Roman frontier studies would do well to note the growing body of historical archaeology studies in the New World, where properly grounded archaeological models are now being integrated successfully with historical data (*e.g.* Orser 1996).

Within this overall framework of a more dynamic historical/archaeological model, three key immediate areas should be addressed to further the conclusions of this study. These are: a detailed study of resources and sourcing studies of patterns of artefacts associated with military use; more focussed landscape surveys of Classical communication routes; and a detailed build-up of historical and archaeological datasets for the whole of the Roman Eastern frontier.

Although the spatial correlation of military sites with resources provides a coherent model, it still needs to be further corroborated by archaeologically testing several key areas of artefact movement and resource areas. For example, key points of copper production in the Wadi Arabah must be shown to be worked in the Roman and Byzantine period. While the Wadi Faynan (Hauptmann 2000) and Timna (Rothenburg 1972) are well known, other areas have not been properly investigated. If one acknowledges the massive supply, production and redistribution processes generated by the *fabricae*, then it is clear that there should exist clear patterns of this behaviour in the archaeological record. Thus, importantly, excavations at Roman military sites should focus more on the sourcing and distribution of the artefacts than on questions of architectural origin and development. It is believed that by gaining a better understanding of artefact pattern behaviour, the development of direct analogues of the resource model outlined in this study would be facilitated.

While a modern, detailed examination of ancient routes has been extensively carried out in Jordan and Israel/Palestine, this has not been achieved in Syria since the pioneering work of Poidebard in the 1930s (Poidebard 1934). As has been borne out by this study, the study and analysis of Classical period routes provides the basic framework for research into military and economic systems. Thus future research must address this problem fully. This should be achieved by properly focussed landscape surveys that have as their primary function the

delineation and mapping of such routes. Many modern surveys, rooted in wider considerations of settlement change, concentrate on the traditional definitions of sites and do not sufficiently consider the ancient spatial structure of the survey areas. In addition, with the rise of Cultural Resource Management policies in Middle Eastern countries in the face of rapid industrial development, many surveys focus more on the location of specific sites. What is needed for Jordan and Syria is a similar approach to that carried out by Israeli scholars, where the Classical road infrastructure is properly mapped and analysed (*e.g.*Tsafrir *et al* 1994). Only then can the Roman military and socio-economic system be properly correlated.

While regional surveys like the DAS and the Limes Arabicus Project can map in some detail the development and impact of the Roman imperial regime in limited areas, the main conclusion of this study is that the Eastern Frontier must be considered as a whole and integrated system. This does not mean that survey field projects must encompass ever-larger areas, as this would inevitably degrade the detail and quality of the fieldwork. However, it does mean that synthetic research must be pitched at this level. Thus archaeological studies of the Roman frontier such as Parker's (1986a) must be seen as quite unsuitable to explain the massive landscape impact of such an imperial system. In scale and breadth of study, the archaeological study of the Roman military system in the Middle East should follow Isaac's (1992) mainly historical treatment in his *The Limits of Empire*.

The hypothesis that the military system of the provinces of *Arabia* and then *Palaestina Tertia* is a massive resource system dependant on a integrated road network, and, in the later Roman period, is maintained by a specialised military command, offers a fresh reinterpretation of the archaeological database of Roman and Byzantine sites in southern Jordan. This study does not advocate a unified military strategy to combat nomadic threats or keep down subject populations. While no doubt these threats were real and present, it is clear that the patterns of military location in southern Jordan fit a model of resource exploitation that was sustained over a considerable period of time. There was, at times, a clear historical expression of that system of control evident in Tetrarchic propaganda and in the works of later Byzantine writers. Millar, in the conclusion of his vast study of the Roman Near East, characterises the military locations of Jordan and Syria as a "desert frontier [that was] at least as important a factor in the developed military structure of the Roman Near East as rivalry with Persia" (Millar 1993, 511). As has been argued in this study, the view of a military desert frontier can no longer be maintained. Nevertheless, Millar is partially correct to stress the importance of the military locations in Jordan, but for the wrong reasons. As this study

amply demonstrates, the military installations of southern Jordan were part of a frontier-wide pattern of resource exploitation on a vast scale. This hypothesis rests on a more meaningful interpretation of archaeological data than offered to date.

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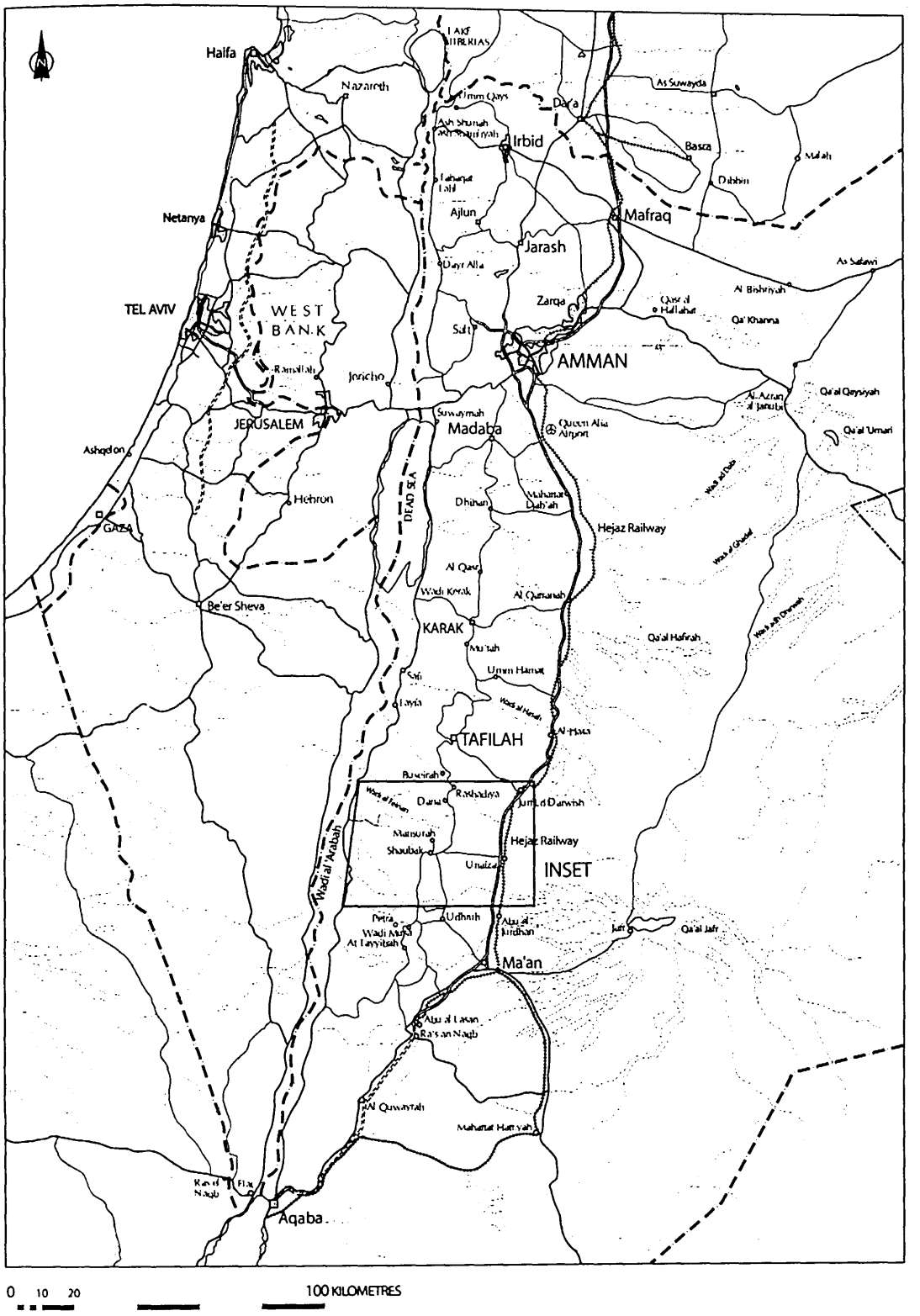



Figure 1 Map of Jordan showing DAS project area

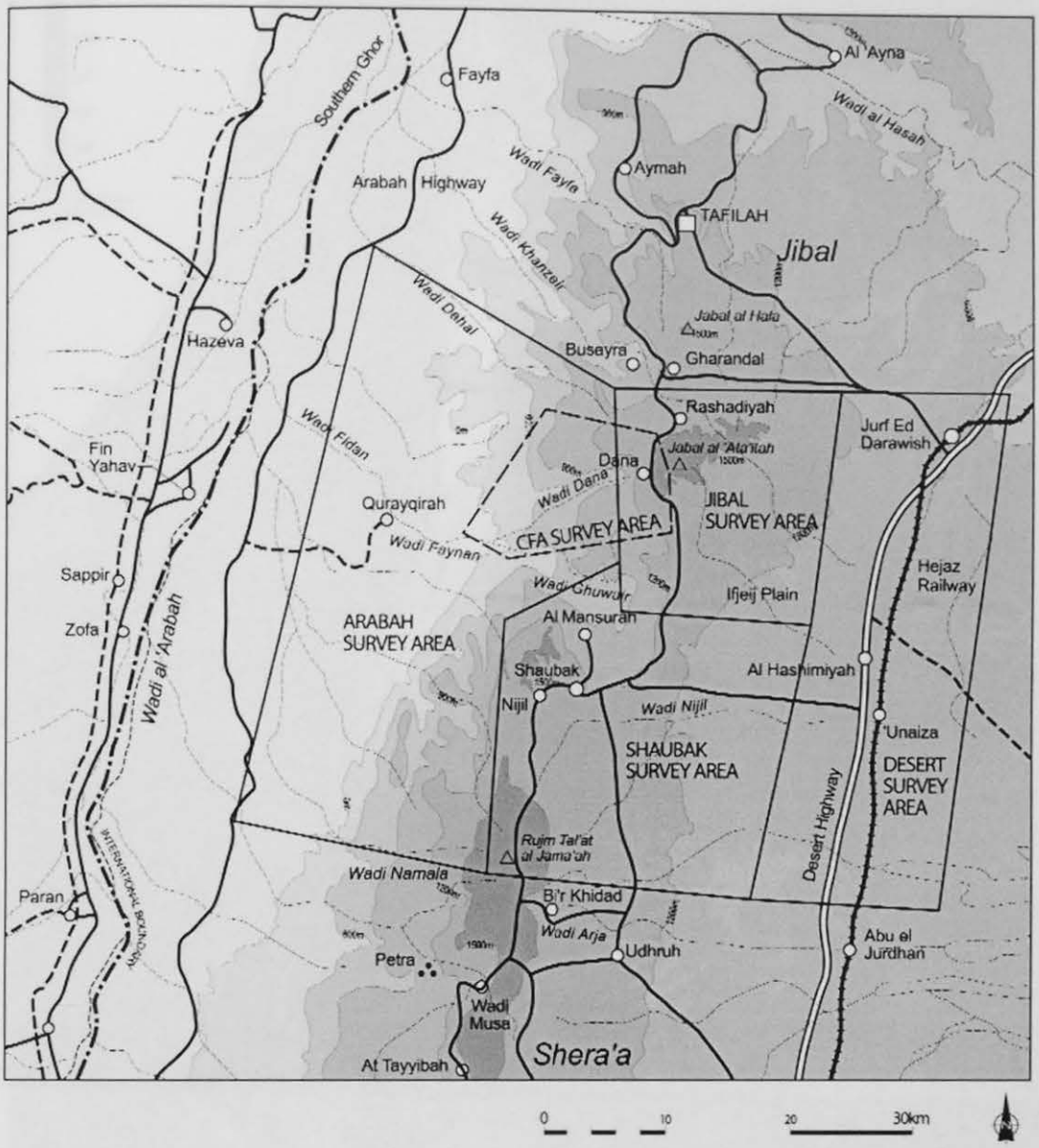



Figure 2 DAS and CFA fieldwork area

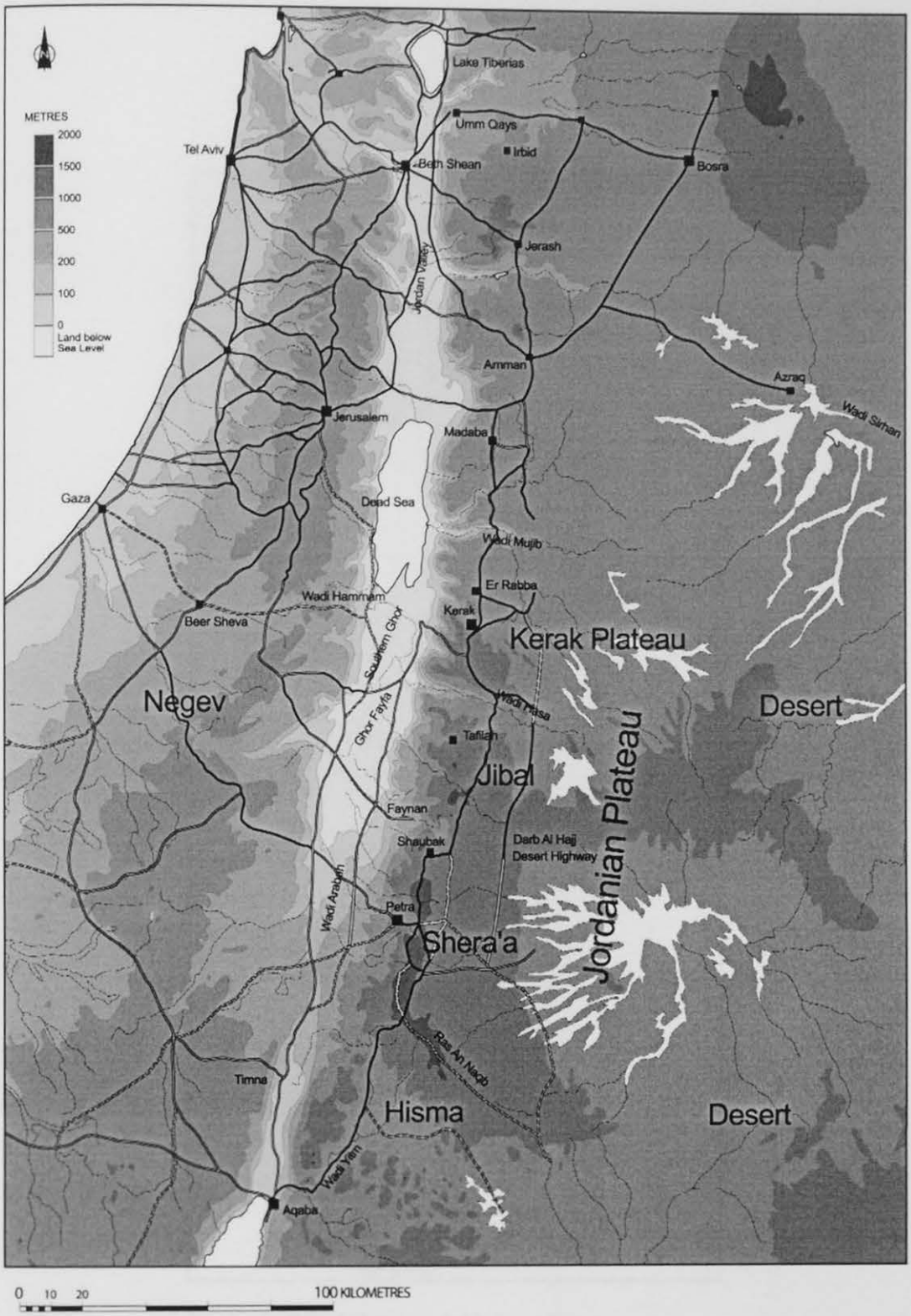



Figure 3 Map of Jordan and Israel showing geo-environmental areas

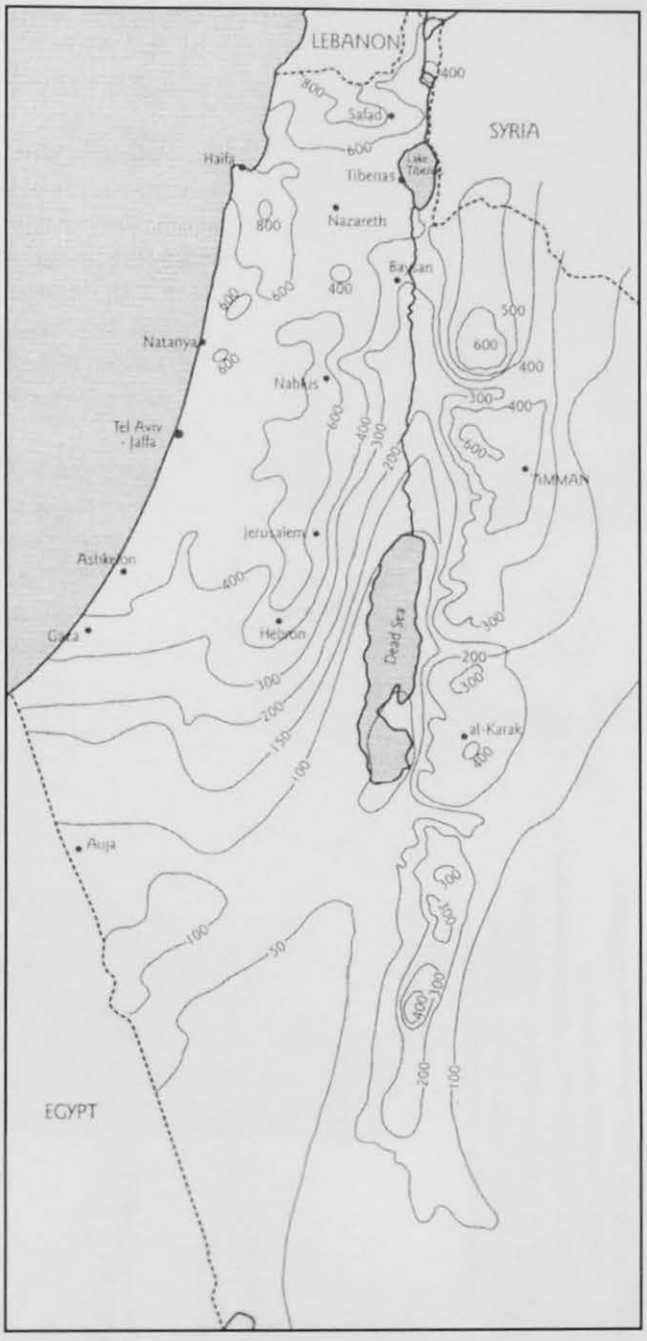



Figure 4 Rainfall map of Jordan. *From MacDonald 2000a, 32 Fig. 54*

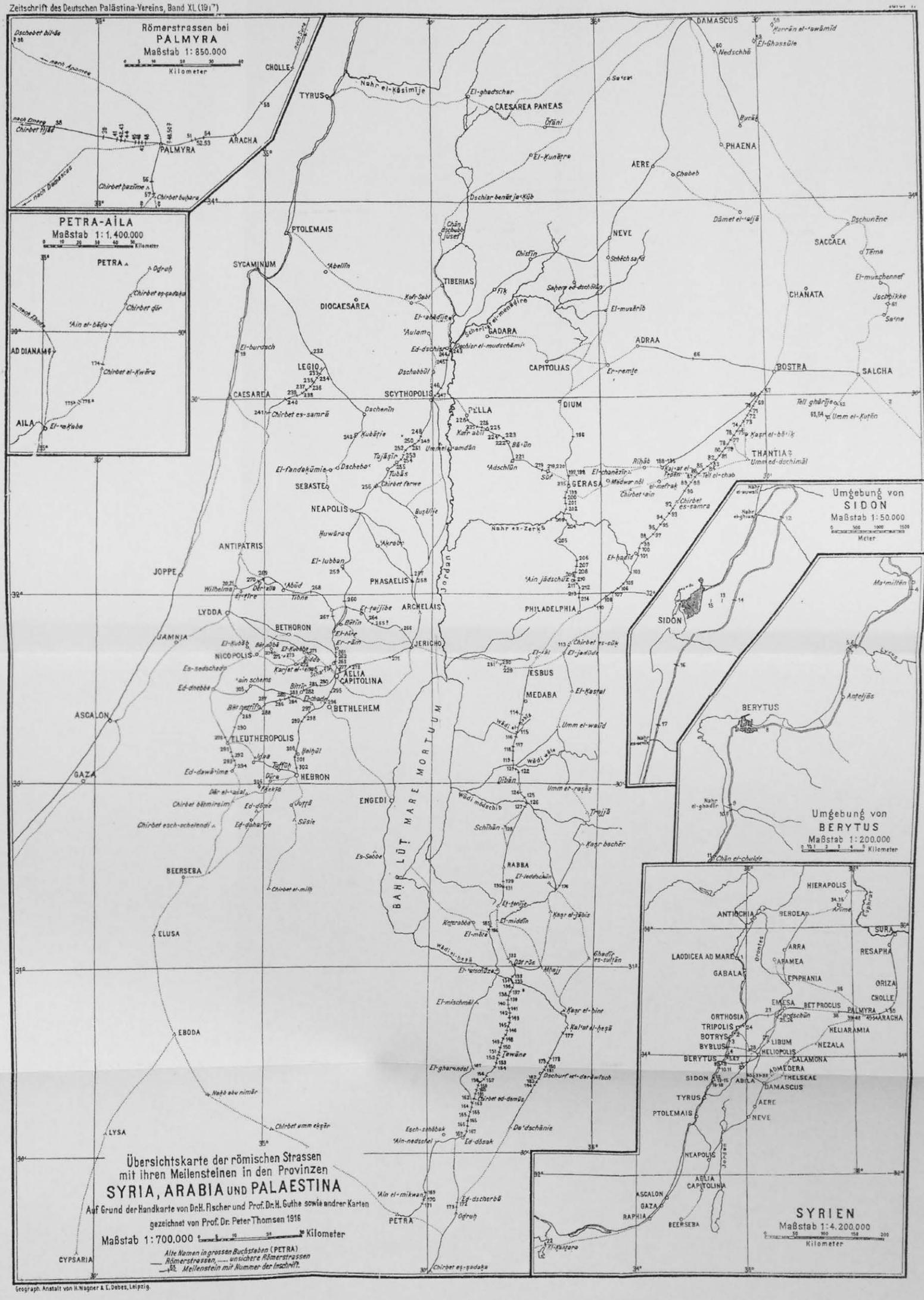



Figure 5
Map of Thomsen's milestone locations.
*From Thomsen 1917 Tafel 1, 1.*

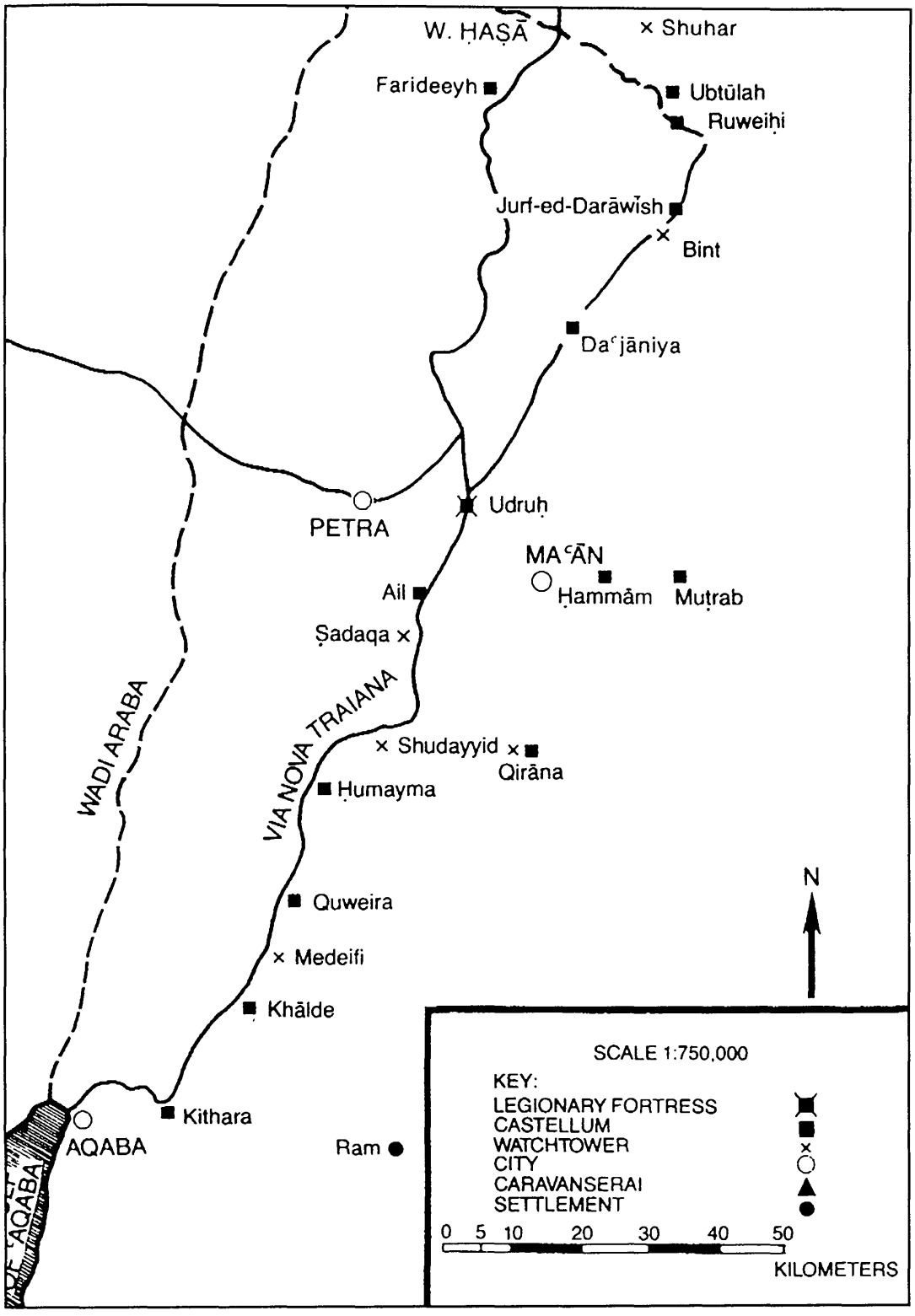



Figure 6 Parker's southern sector. *From Parker 1986a, 88 Fig. 38*

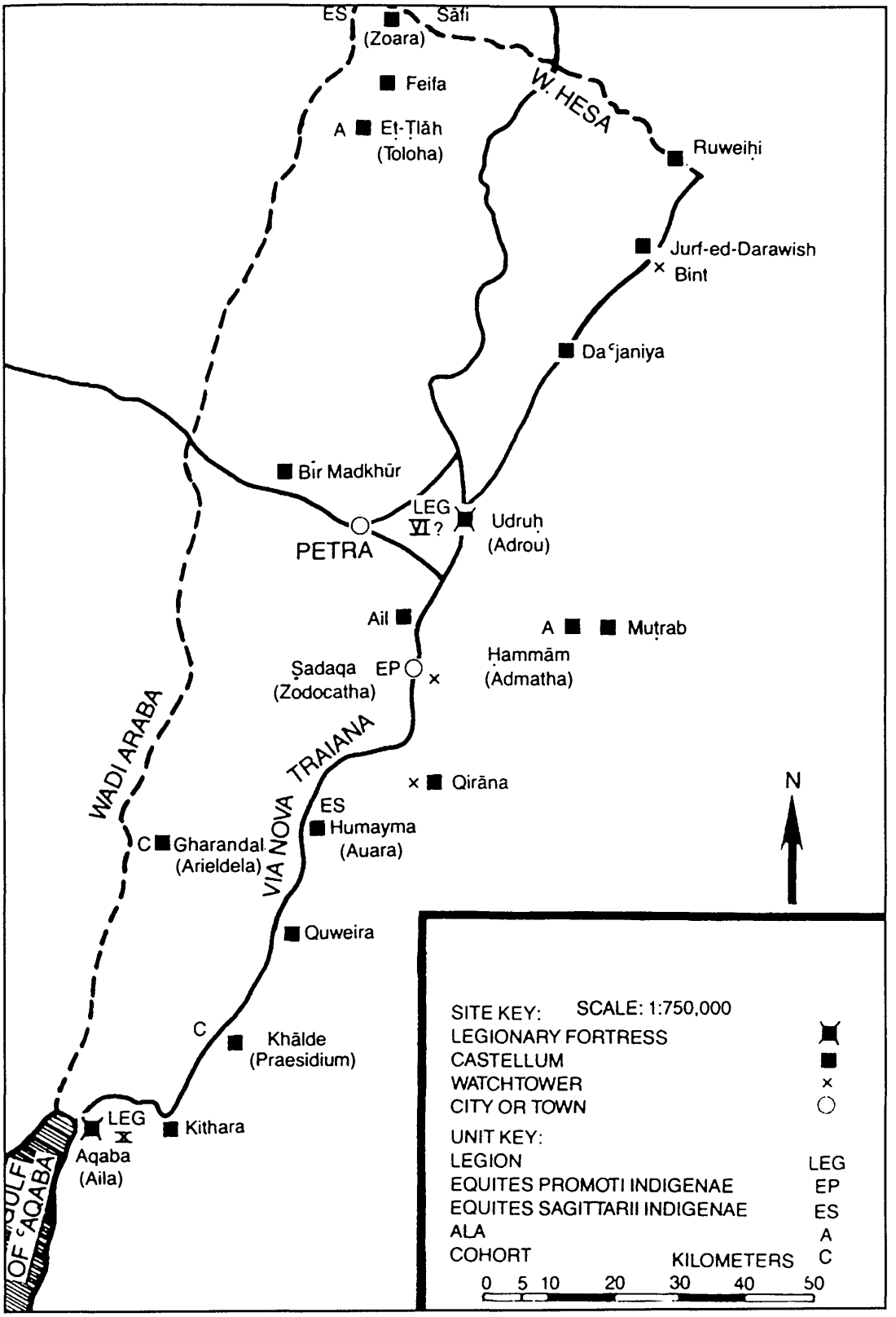



Figure 7 Parker's Arabian Frontier 4th century AD. *From Parker 1986a, 140 Fig. 53*

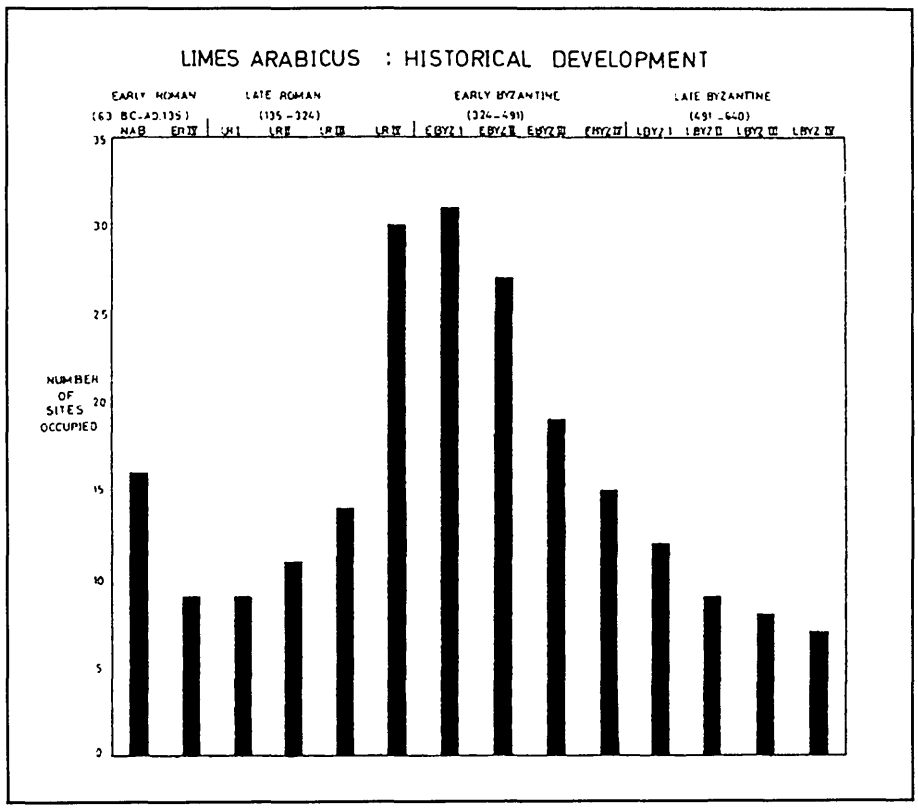



Figure 8 Parker's ceramic results. *From Parker 1976, 31 Fig. 3*

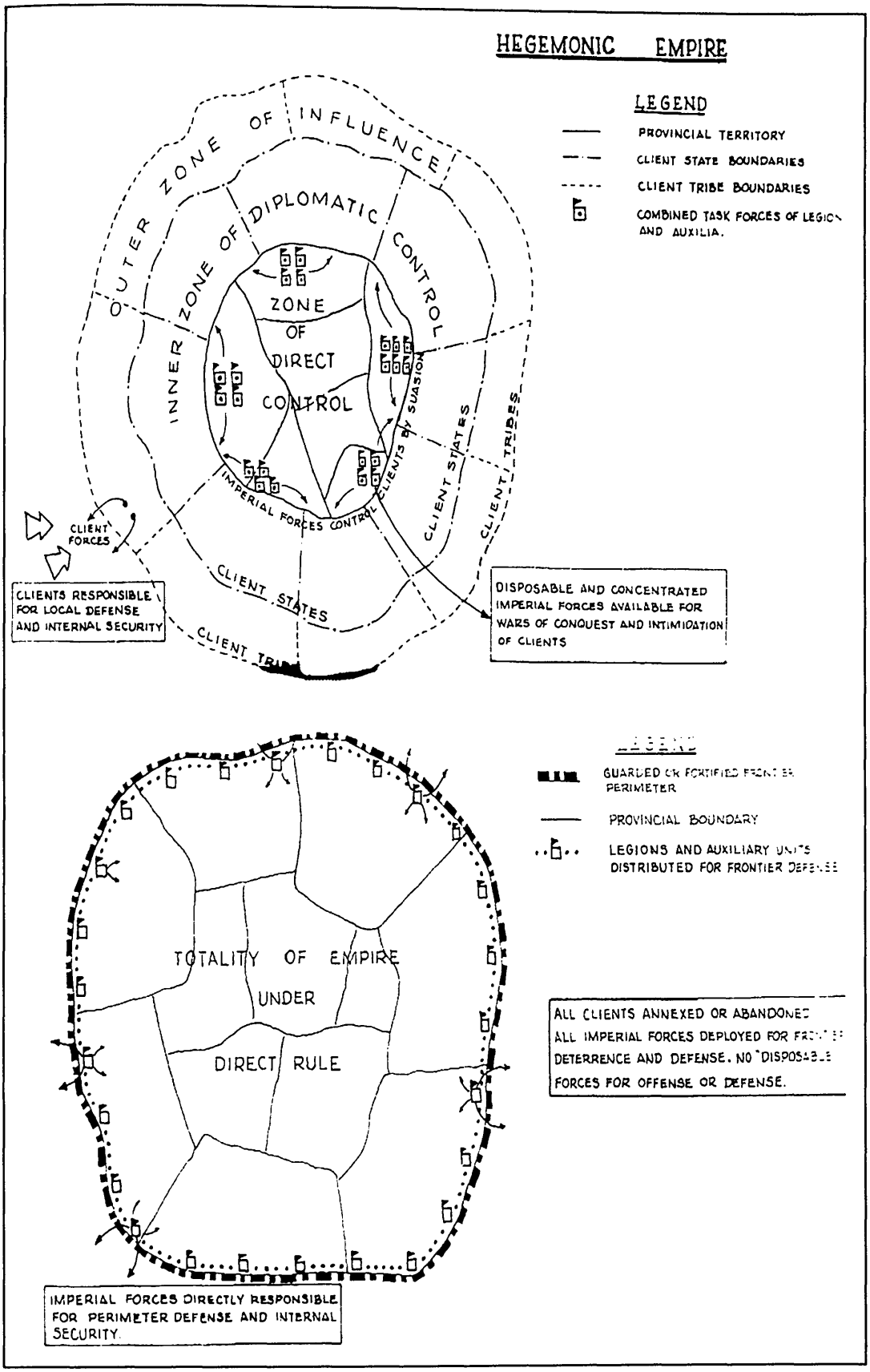



Figure 9 Luttwak's models of Empire. *From Luttwak 1979, 22-23 Fig. 1.2*

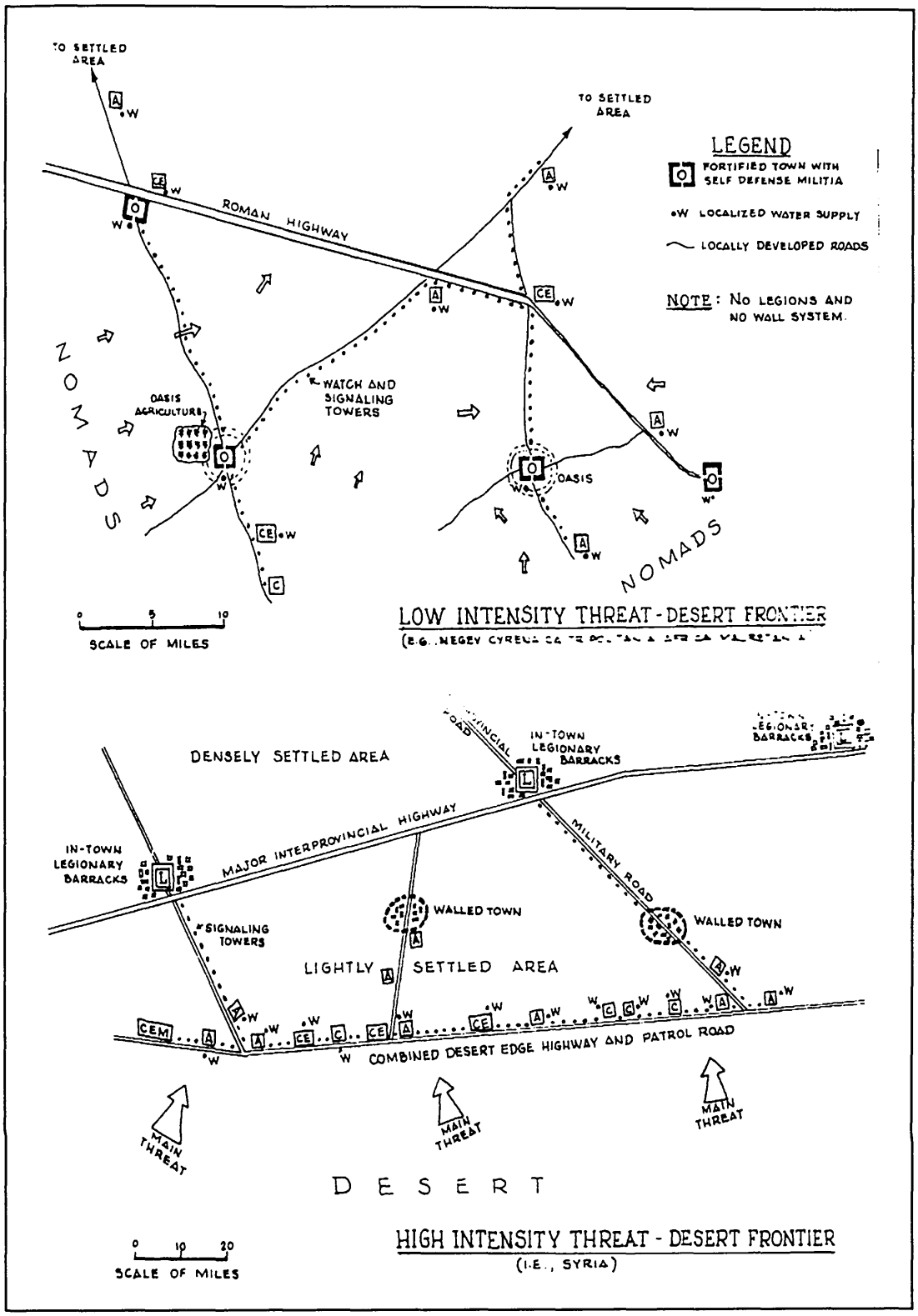



Figure 10 Luttwak's models of frontier defence. *From Luttwak 1979, 62-63 Fig. 2.1*

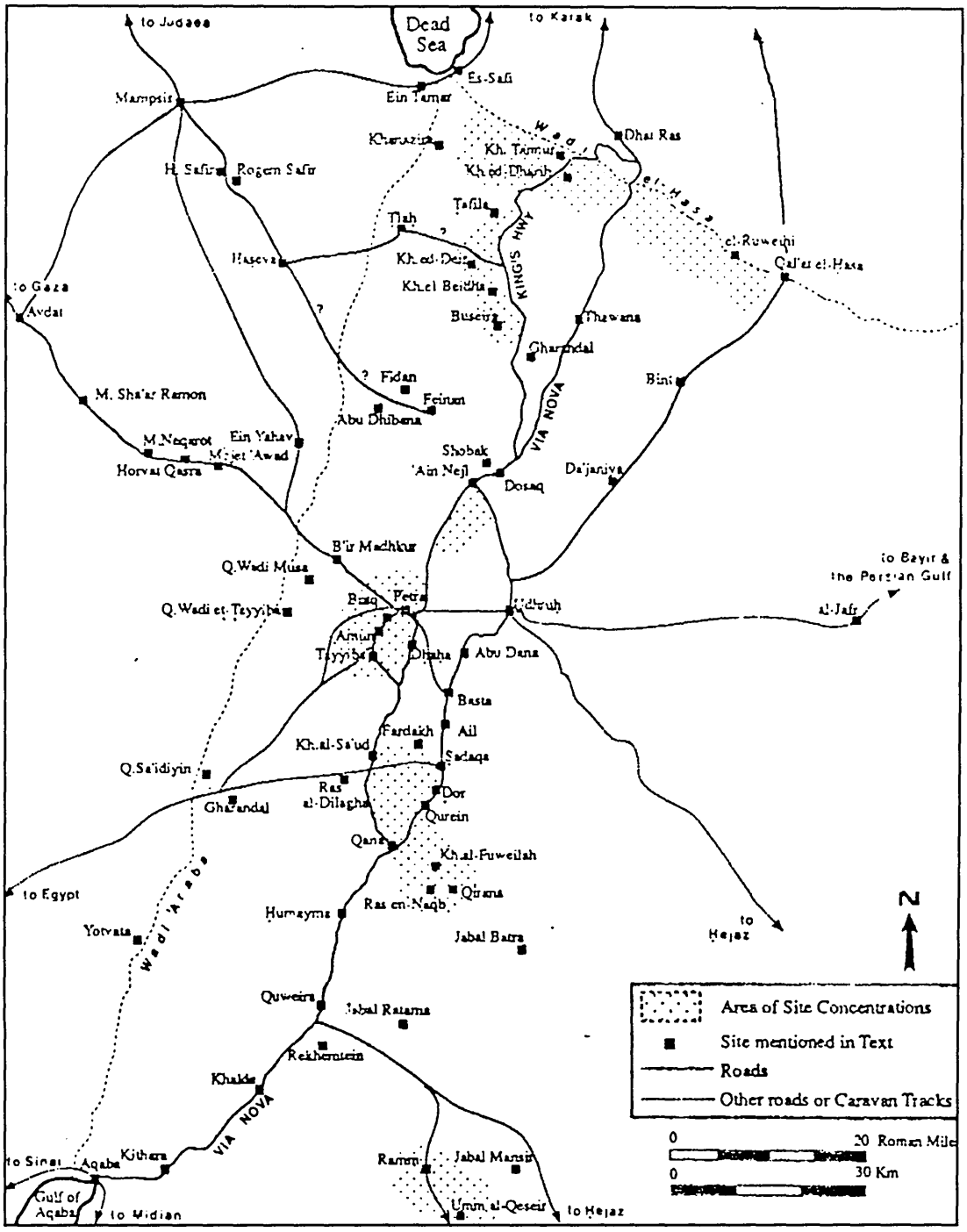



Figure 11 Nabataean & Early Roman settlement patterns. *From Fiema 1991, 279 Map 5*

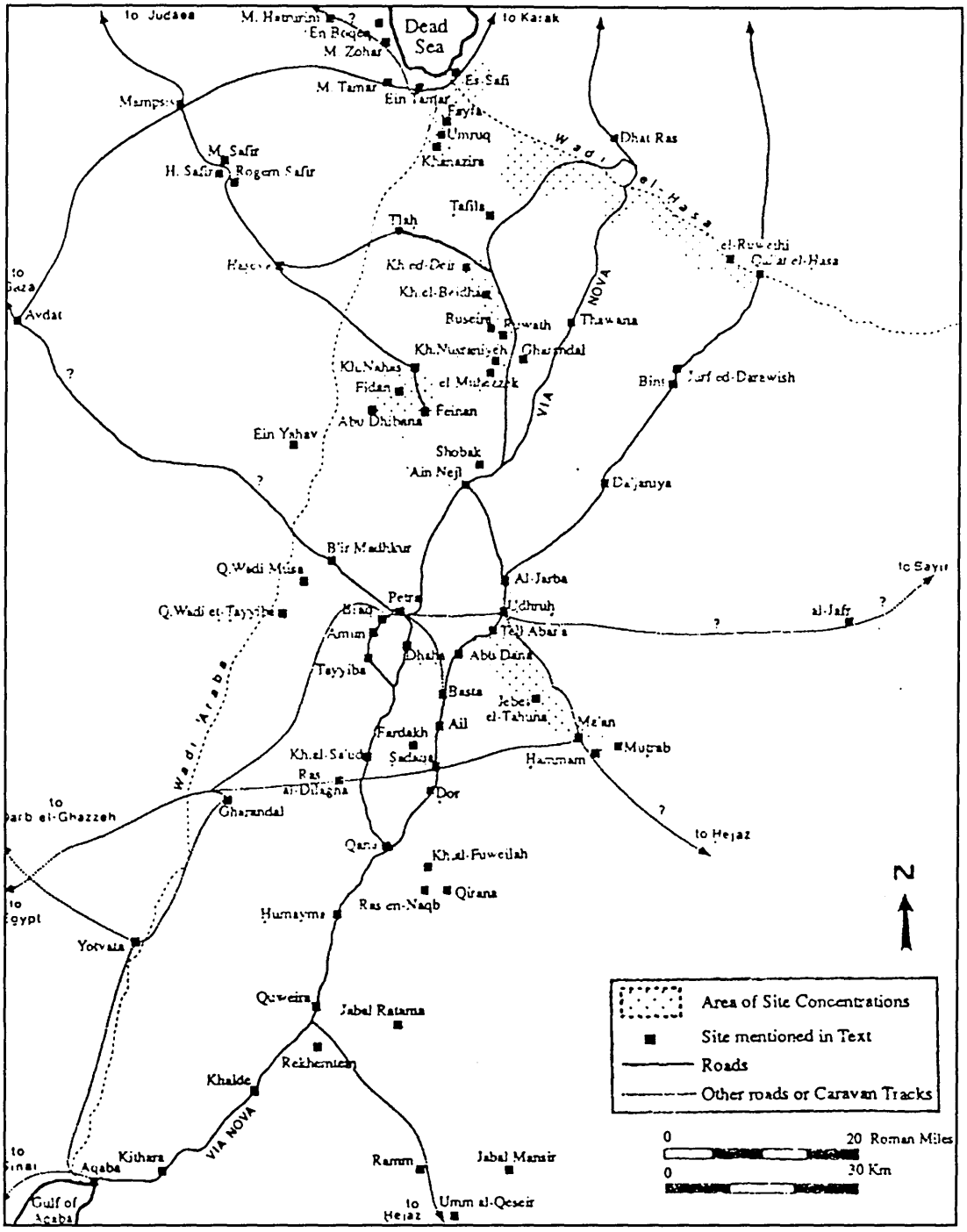



Figure 12 Early Byzantine settlement patterns. *From Fiema 1991, 281 Map 7*

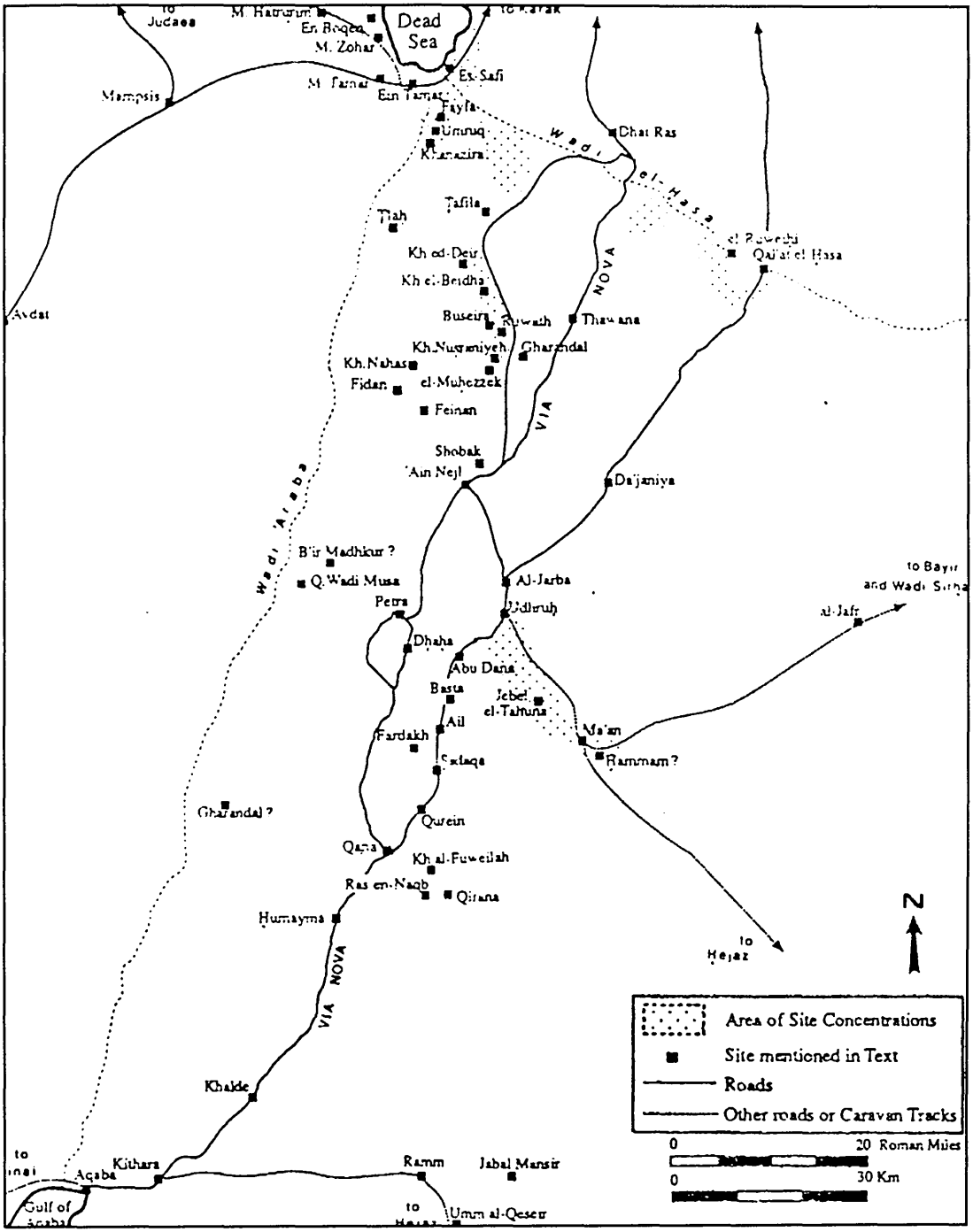



Figure 13 Byzantine settlement patterns. *From Fiema 1991, 283 Map 9*

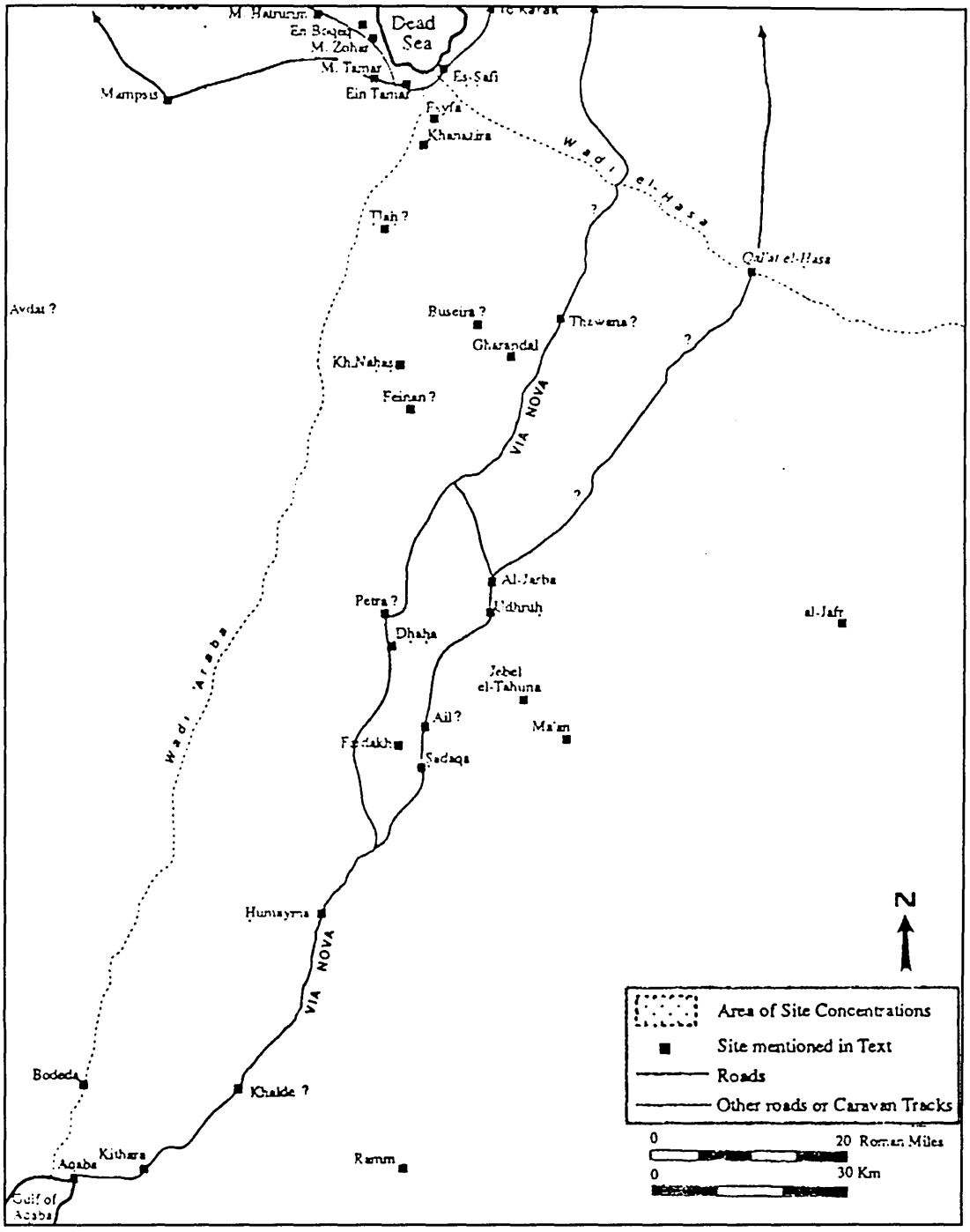



Figure 14 Early seventh century AD settlement. *From Fiema 1991, 284 Map 10*

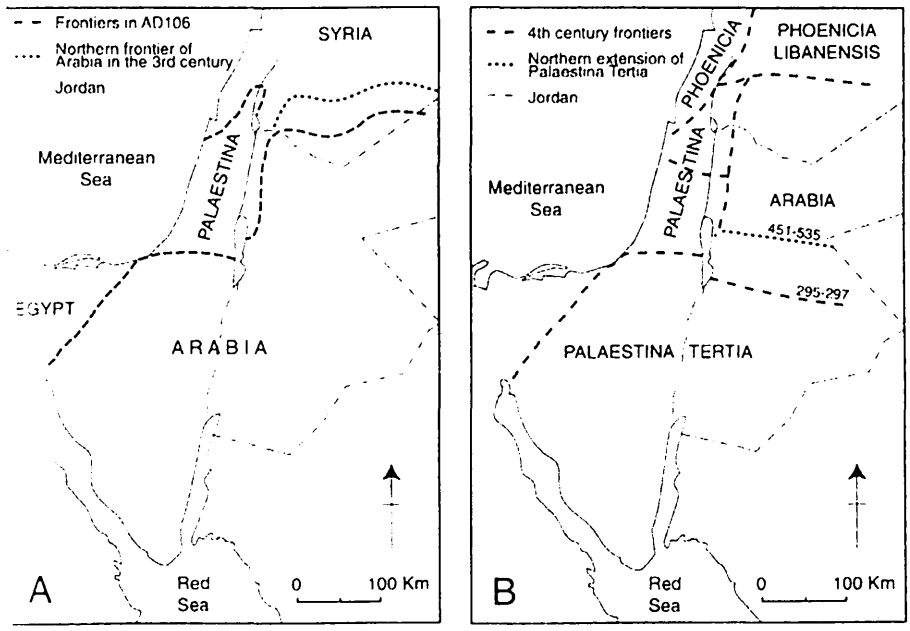



Figure 15
Map of Jordan with Roman Arabia of AD 106 superimposed

Map of Jordan with the late Roman provinces superimposed

*From Kennedy 2000, 39 Fig. 4.2*

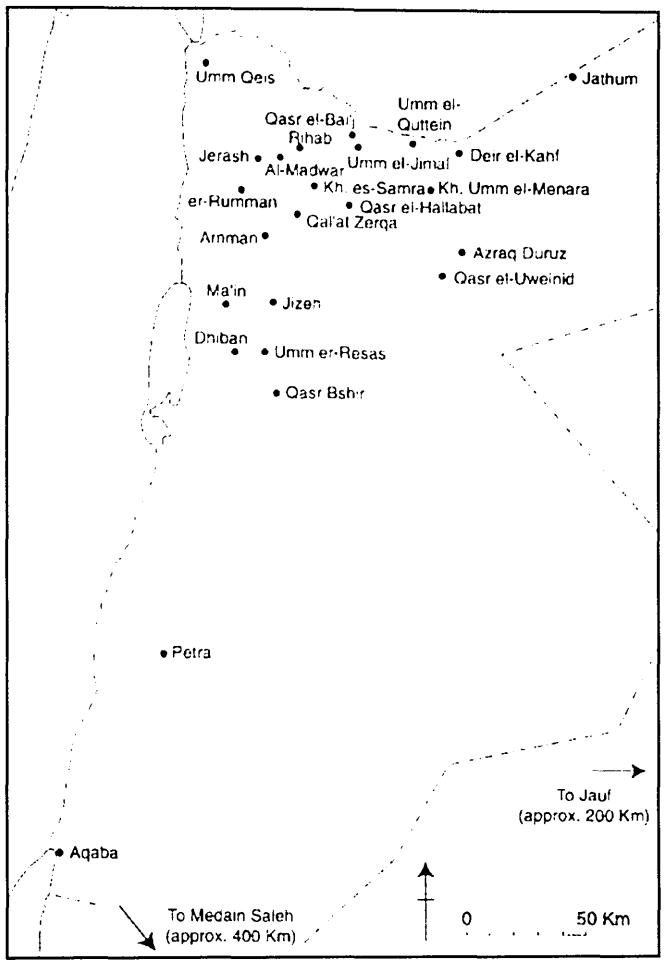



Figure 16
Map showing the find spots of military inscriptions in Jordan. *From Kennedy 2000, 23 Fig. 2.1*

| Name | Reference | Longitude | Latitude | Modern Name |
|---|---|---|---|---|
| Γαζαιων λιμήν | 371, 11 | 65° 10'<br>64° 45' | 31° 50'<br>31° 30 | Gaza port |
| Ἀσχαλων | 371, 12 | 65°<br>65°<br>65° 10' | 31° 40'<br>31° 30'<br>31° 20' | Ashkelon |
| Γάζα | 372, 1 | 65° 25'<br>65° 35' | 31° 45'<br>31° 15' | Gaza |
| Βαπογαβρει | 372, 7 | 65° 30'<br>65° | 31° 30'<br>31° | Beit Jibrin |
| Ἱεροσόλυμα<br>Αἰλία Καπιτωλία | 372, 14-15 | 66° | 31° 20'<br>31° 40'<br>31° 10' | Jerusalem |
| Ἐνγάδδα | 372, 17 | 66° 30'<br>66° 10' | 31° 15' | Engaddi |
| Βηδωρώ | 372, 18 | 66° 30'<br>66° | 31°<br>31° 15' | En Boqeq |
| Θαμάρω | 372, 19 | 66° 20'<br>66° 30'<br>66° | 30° 50'<br>31° 20'<br>31° 55' | Qasr El Juheiniye |
| Καλλιρρόη | 372, 23 | 67° 5' | 31° 10' | Ain Zara |
| Βέρζαμμα | 372, 28 | 64° 50'<br>65°<br>64° 10' | 31° 15' | Khirbat El- Far |
| Καπαρόρσ | 373, 1 | 65° 30'<br>65°<br>65° 10' | 31° 15' | Khirbat Khureisa? |
| Γεμμαρουρις | 373, 2 | 65° 50'<br>65°<br>65° 10' | 31° 10' | Khirbat Jemrura? |
| Ἑλούσα | 373, 3 | 65° 10'<br>65°<br>68° 10' | 30° 50'<br>30° 55'<br>30° 10' | Khalasa |
| Μαψ | 373, 4 | 65° 40'<br>65°<br>65° 20' | 30° 50'<br>30° 55' | Kurnub |
| Ἐλάνα | 373, 23-25 | 65° 50'<br>65° 36' | 29° 15' | Aqaba |
| Εβοδα | 374,16 | 65° 15' | 30° 30' | 'Abda |
| Μαλιάθα | 374, 17 | 65° 45'<br>65° 15' | 30° 30'<br>30° 20' | Ain Hosb? |
| Καλγουία | 374, 18 | 66° 20'<br>66° 1/6 | 30° 30'<br>30° 10' | Qasr Tlah? |
| Λύσα | 374, 19 | 65° 50'<br>65° 10' | 30° 15' | Bir Madhkur? |
| Γούββα | 374, 20 | 65° 45'<br>65° ½ 1/6 | 30° | Beer Menuha? |
| Γυψαρία | 374, 21 | 65° 40'<br>65° 20' | 29° 45' | Khirbat Gharandal? |
| Γέρασα | 374, 22 | 65° 30' | 29° 45' | Ain Ghadyan? |
| Πέτρα | 374, 23 | 66° 45' | 30° 20' | Petra |
| Χαράχμωβα | 374, 24 | 66° 10'<br>66° 30' | 30° | Kerak |
| Αὐάρα | 374, 25 | 66° 10'<br>66° 30' | 29° 40'<br>29° 20' | Humamya |
| Ζαναάθα | 374, 26 | 66° 45' | 29° 50' | Sadaqa |
| Ἄδρου | 374, 27 | 67°<br>67° 38 1/3 | 29° 55' | Udruh |
| Ζοάρα | 374, 28 | 67° 20' | 30° 30' | As-Safi |
| Θάνα | 374, 29 | 67° 30' | 30° 30' | At-Tuwanah/Dana |
| Νέχλα | 374, 30 | 67° 30' | 30° 15' | Nijil |
| Κληθαρρώ | 374, 31 | 67° 50'<br>67°<br>67° 30' | 30° 20' | Kathrabba? |
| Ἔσβούτα | 375, 2 | 68° 30'<br>67° 50'<br>67° 55' | 31° | Hesban |
| Ζιζα | 375, 3 | 68° 45' | 31° | Jiza |
| Μηδαυα | 375, 5 | 68° 30'<br>69° | 30° 45'<br>30° 15' | Madaba |
| Ραβάθμωβα | 375, 7 | 68° 30'<br>68° 15' | 30° 30'<br>30° 40'<br>30° 20' | Ar-Rabba |
| Ἄνίθα | 375, 8 | 68° 40'<br>69° 40'<br>68° 20' | 30° 15'<br>31° 15' | Aina |
| Βόστρα λεγιων | 375, 10 | 69° 45'<br>68° 45'<br>68° 15' | 31° 30'<br>31° 10' | Bosra |

Table 1
Ptolemy's co-ordinates
and *Arabia Petraea*


Figure 17
Thomsen's map of locations in *Arabia. From Thomsen 1903*

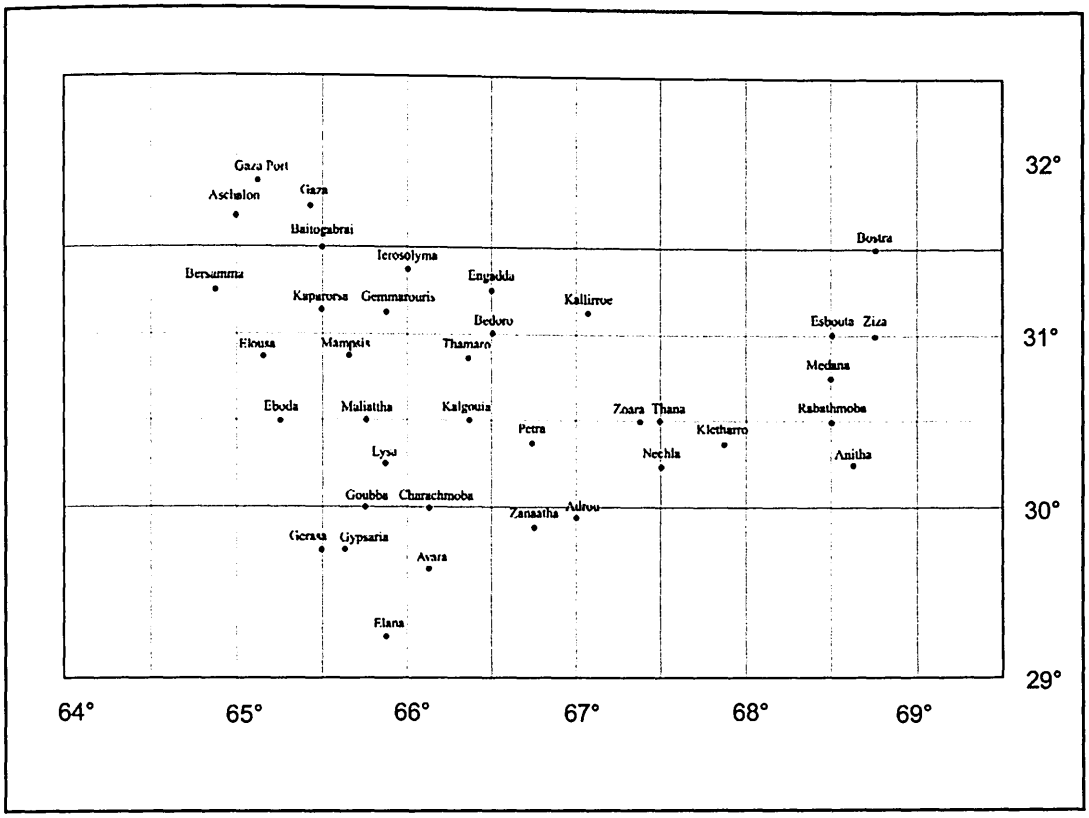



Figure 18 Map of *Arabia Petraea* using Ptolemy's co-ordinates

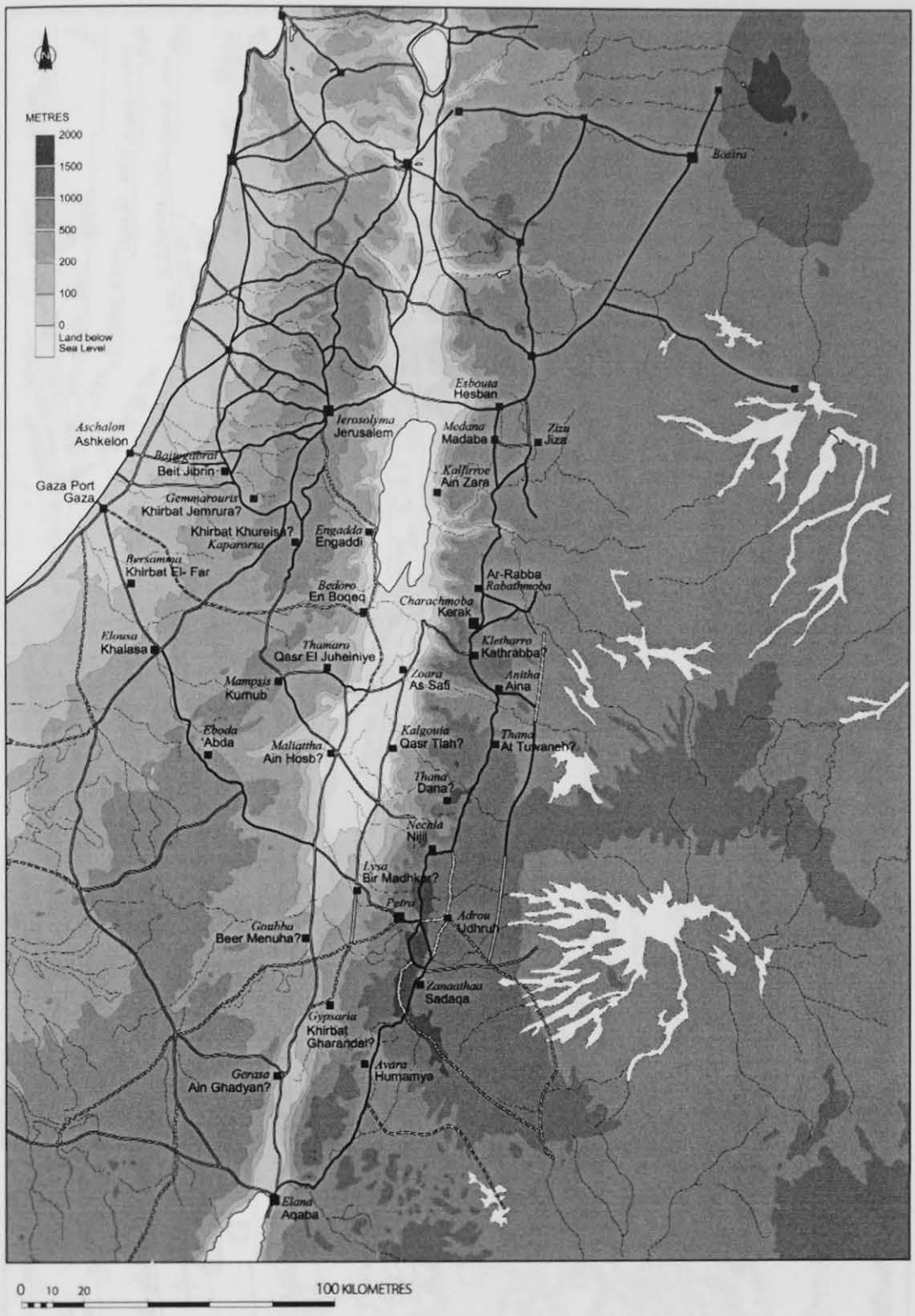



Figure 19 Modern map of Ptolemy's locations in *Arabia Petraea*

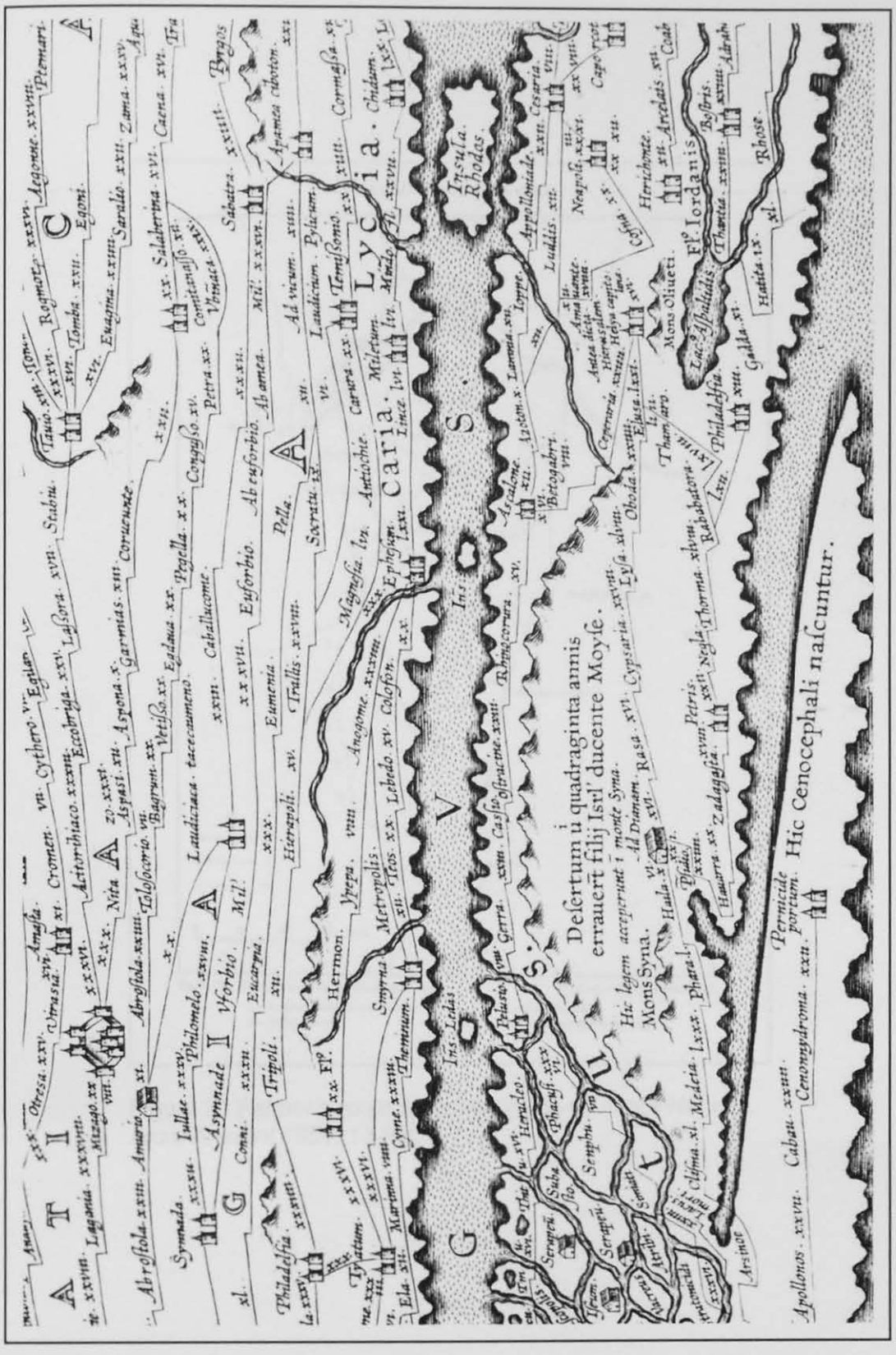



Figure 20 Section of *Tabula Peutingeriana* showing Arabia. From *http://www.fh-augsburg.de/~harsch/Chronologia/Lspost03/Tabula/tab_wels.html*

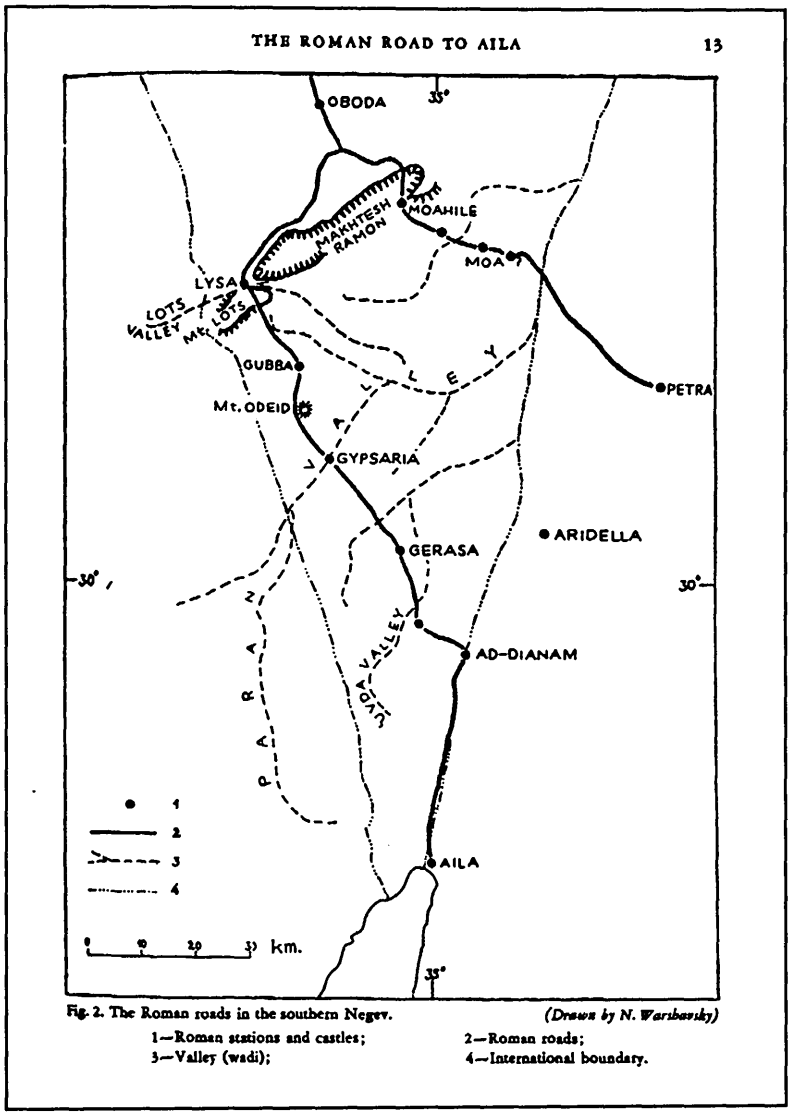



Figure 21 Palmer's route for roads in the southern Negev.
*From Aharoni 1954, 13 Fig. 2*

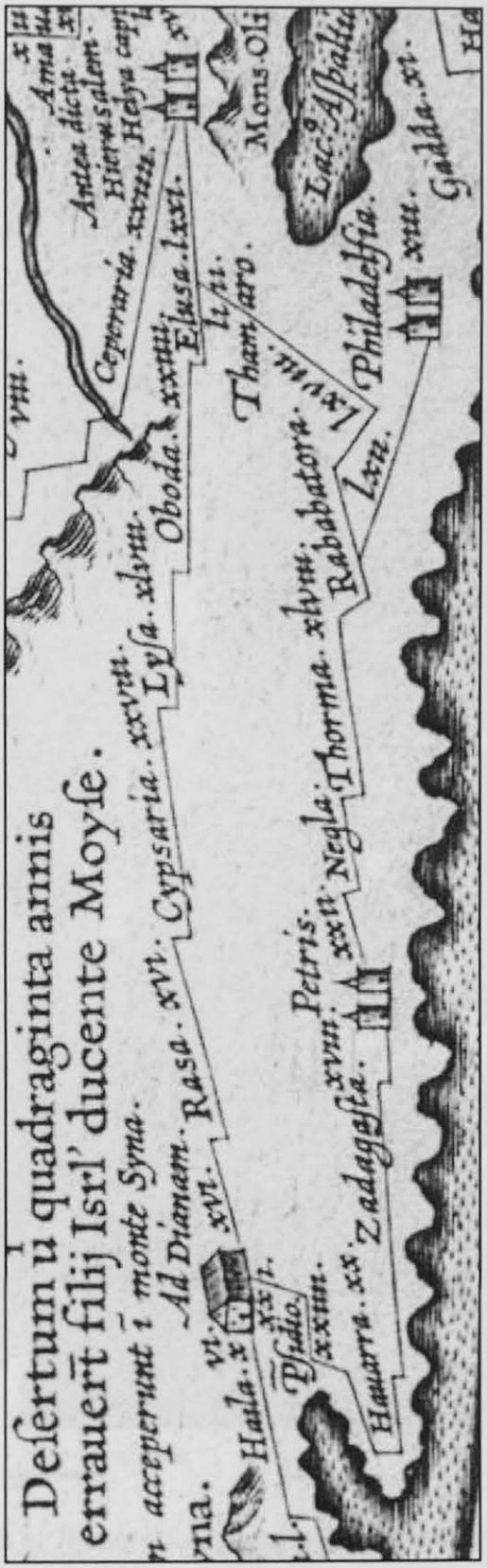



Figure 22 Detail of *Tabula Peutingeriana* showing routes in Arabah & Jordan.*From http://www.fh-augsburg.de/~harsch/Chronologia/Lspost03/Tabula/tab_wels.html*

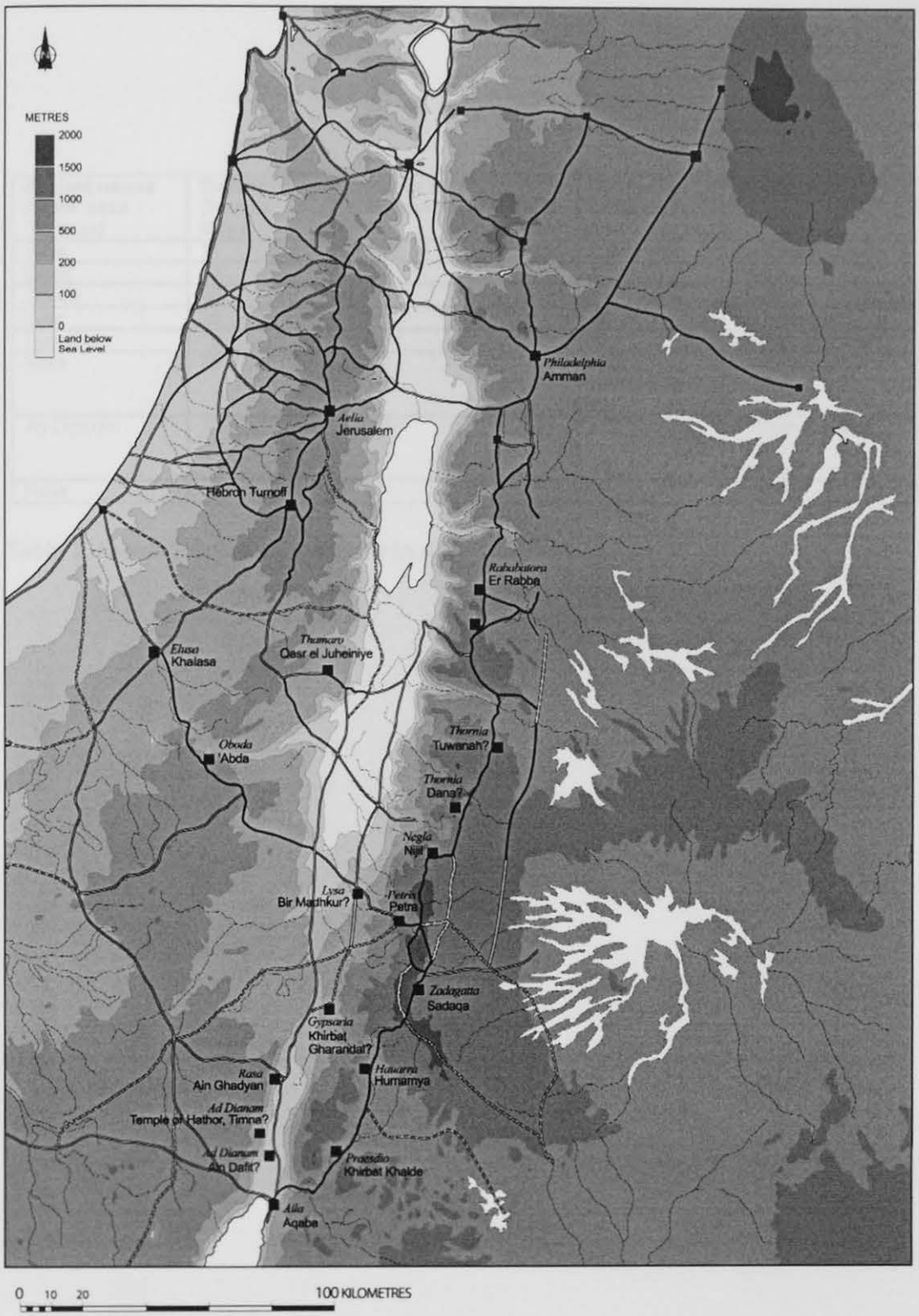



Figure 23 Modern map of *Tabula Peutingeriana* locations in Arabia

| Ancient names (From xxxx To xxxx) | Distance (Roman Miles) | Distance in km (1 Roman Mile = 1.48km) | Measured Distance in km | Modern Name |
|---|---|---|---|---|
| Aelia | 71 | 105.08 | 103 * | Jerusalem |
| Elusa | 24 | 35.52 | 39* | Khalasa |
| Oboda | 48 | 71.04 | 71 | 'Abda |
| Lysa | 28 | 41.44 | 40 | Bir Madhkur? |
| Gypsaria | 16 | 23.68 | 28 | Khirbat Gharandal? |
| Rasa | 16 | 23.68 | c20?<br>(40km to Aila)<br>c22 | Ain Ghadyan |
| Ad Dianam | 16 | 23.68 | c32<br><br>c20 | Temple of Hathor, Timna?<br>Ain Dafit |
| Haila | | | | Aqaba |

Table 2 *Tabula Peutingeriana Aelia* to *Aila*

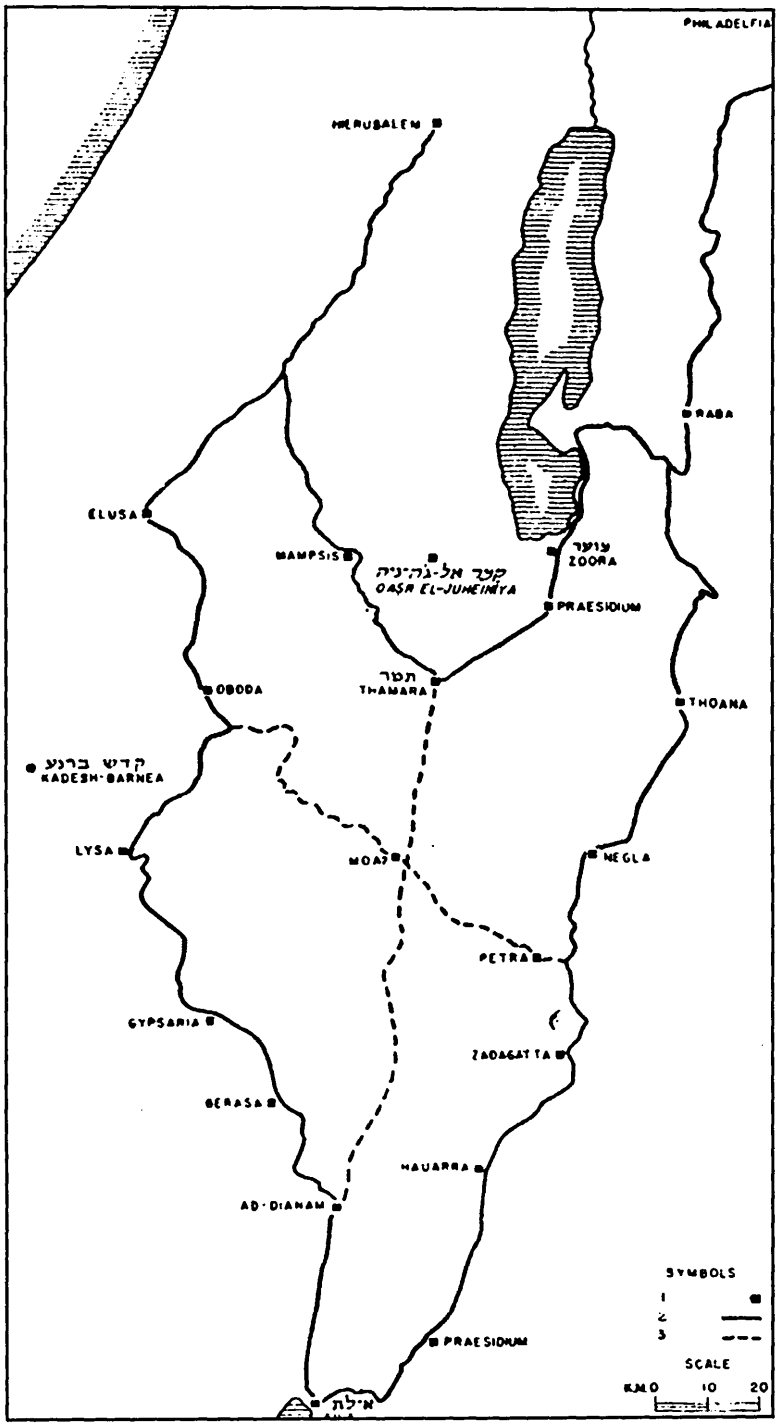



Figure 24 Aharoni's location of sites on Aelia to Aila route.
*From Aharoni 1963, 35 Fig. 1*


Figuire 25 Detail of road leading to *Ad Dianam*. *From* http://www.fh-augsburg.de/~harsch/Chronologia/Lspost03/Tabula/tab_wels.html

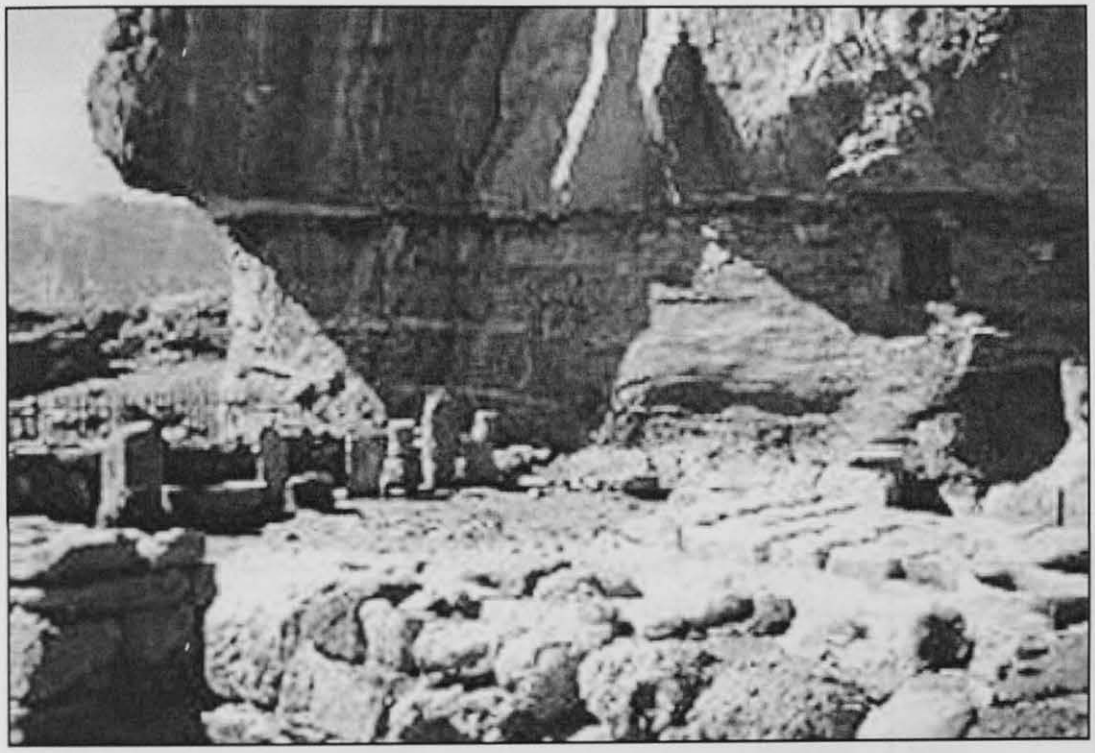


Figure 26 Photo of cultic site at Timna. *From http://www.mfa.gov.il/mfa/go-visual.asp?MFAJ01wn0*

| Ancient names (From xxxx To xxxx) | Distance (Roman Miles) | Distance in km (1 Roman Mile = 1.48km) | Measured Distance in km | Modern Name |
|---|---|---|---|---|
| Aelia | 71 | 105.08 | 103 * | Jerusalem |
| Elusa | | | | Khalasa |
| (from Hebron turnoff) | 53 | 78.44 | 77/78? | |
| Thamaro | 68 | 100.64 | 96 | Qasr el Juheiniye |
| Rababatora | | | | Er Rabba |

Table 3 *Tabula Peutingeriana Aelia* to *Rababatora*

| Ancient names (From xxxx To xxxx) | Distance (Roman Miles) | Distance in km (1 Roman Mile = 1.48km) | Measured Distance in km | Modern Name |
|---|---|---|---|---|
| Philadelphia | 62 | 91.76 | 94? | Amman |
| Rababatora | 48 | 71.04 | 75 (63) | Er Rabba |
| Thornia | | | | Dana? (Tuwanah) |
| Negla | 22 | 32.56 | 32 | Nijil |
| Petris | 18 | 26.64 | 27 | Petra |
| Zadagatta | 20 | 29.6 | 30 | Sadaqa |
| Hauarra | 24 | 35.52 | 36 | Humamya |
| Praesdio | 21 | 31.08 | 32 | Khirbat Khalde |
| Aila | | | | Aqaba |

Table 4 *Tabula Peutingeriana Philadelphia* to *Aila*

| Eusebius | Type of site | Hieronymus (Jerome) | Type of site | Location | Modern name |
|---|---|---|---|---|---|
| Θαιμαν 96, 18-23 | χώμη ἐγχαθηται | Theman 97, 14-19 | villa praesidium | Gebalena | Dana area? |
| Καρχα 116, 17-19 | φρυριον | Carcaria 117, 14-16 | castellum | One days journey from Petra | Khirbat Qirana? |
| Χερμαλα 118, 5-7 | χώμη φρυριον | Chermela 119, 4-6 | villa praesidium | | Kirmil |
| Μαλεδομνει 24, 9-11 | χώμη φρυριον | Maledomni | Ruined villa/village Castellum (on road) | | Tal'at Ed Damm |
| Ροωβώθ 142, 13-14 | φρυριον | Rooboth 143, 14-16 | vicus grandis praesidium | Gebalena | Qasr Fafya? |
| Μηφαάθ 128, 21-23 | φρυριον | Mefaath 129, 20-21 | vicus? praesidium | | Umm Er Rasas |
| Zoopa 42, 1-5 | φρυριον | Zoara 43, 9-16 | præsidium | | As Safi |
| Ἀφεχα 22, 19-21 | λεγομενη | Afeca | castellum grandis | Near Hippos in Palestine | Afiq |
| Θαμαρα 8, 6-9 | χώμη φρυριον | Thamara 9, 5-8 | castellum praesidium | One days journey from Mampsis on Hebron-Aila road | Qasr Al Juheiniye |
| Αιλαμ 6, 17; 8, 3 | 10th Legion | Ailath 7, 25; 8, 3 | 10th Legion | Palastinae (Latin only) | Aqaba |
| Βηρσαβεέ 50, 1-12 | χώμη μεγιστι φρυριον | Bersabee 51, 1-12 | vicus grandis praesidium | | Bir es Seba |

Table 5 Eusebius' military sites

| Eusebius | Hieronymus (Jerome) | Location | Modern name |
|---|---|---|---|
| Μηνοείς<br>130, 7-8 | Menois<br>131, 6-7 | | Khirbat Al Ma'in |
| Φινών<br>168, 8-10 | Fenon<br>169, 7-10 | City of Edom<br>Viculus in deserto | Khirbat Faynan |
| Μάψις<br>8, 8 | Mampsis<br>8, 8 | Mampsis oppido | Kurnub |
| Ἱερουσαλήμ<br>106, 1 Passim | Ierusalem<br>107, 1 Passim | | Jerusalem |
| Μαλααθα<br>14, 3 | Malatha<br>15, 2 | Oppido Malathis | Tel El-Milh |

Table 6 Eusebius' locations with later military garrisons

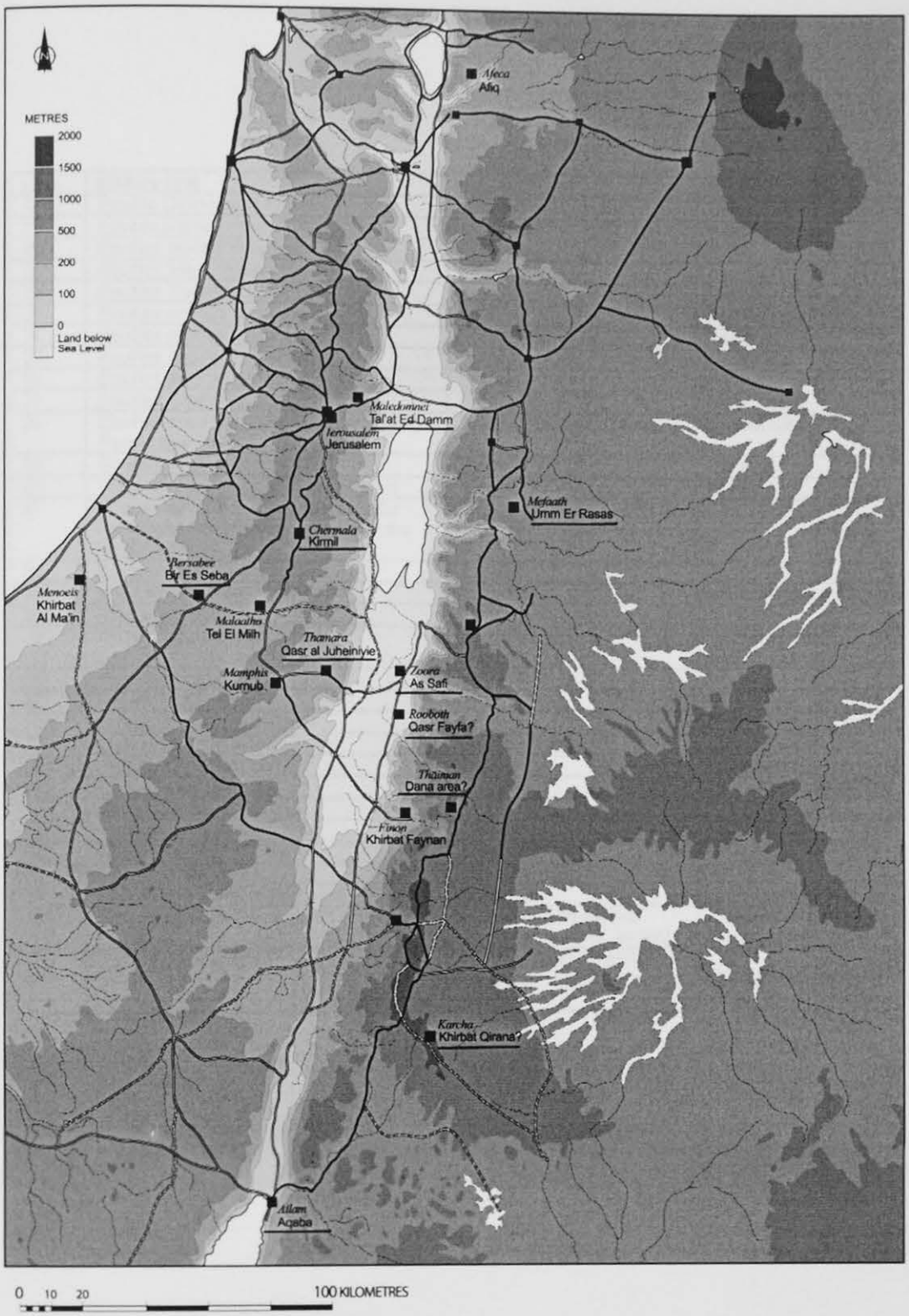



Figure 27 Modern locations of military sites noted by Eusebius (underlined)

| Line | Military Unit | Ancient Name | Modern Location |
|---|---|---|---|
| 18 | *Equites Dalmatae Illyriciani* | *Benosabae* | Beersheva Bir Seba |
| 19 | *Equites promoti Illyriciani* | *Menochiae* | Khirbat Al Ma'in |
| 20 | *Equities scutarii Illyriciani* | *Chermulae* | Kirmil |
| 21 | *Equities Mauri Illyriciani* | *Aeliae* | Jerusalem |
| 22 | *Equities Thamudeni Illyriciani* | *Birsama* | Khirbat el Far |
| 23 | *Equities promoti indigenae* | *Sabaiae* | Khirbat Dajaniyah? |
| 24 | *Equities promoti indigenae* | *Zodocathae* | Sadaqa |
| 25 | *Equities sagittarii indigenae* | *Hauanae* | Humamya |
| 26 | *Equities sagittarii indigenae* | *Zoarae* | As Safi |
| 27 | *Equities sagittarii indigenae* | *Robathae* | Qasr Fafya? |
| 28 | *Equities primi felices [sagittarii indigenae] Palaestinae* | *Sabure sive Veterocariae* | Khirbat Qirana |
| 29 | *Equities sagittarii indigenae* | *Moahile* | Tel el Milh? |
| 30 | *Praefectus legionis decimae Fretensis* | *Ailae* | Aqaba |
| 31 | *Et quae de minore laterculo emittuntur* (And these which are assigned from the lesser register) | | |
| 32 | *Ala prima miliaria Sebastena* | *Asuada* | ? |
| 33 | *Ala Antana dromedariorum* | *Admatha* | Ma'an/Al Hammam |
| 34 | *Ala Constantiana* | *Toloha* | Qasr Tlah |
| 35 | *Ala secunda felix Valentinan* | *apud Praesidium* | Khirbat Kithara/ Khirbat Quweira |
| 36 | *Ala prima miliaria* | *Hasta* | ? |
| 37 | *Ala Idiota constituta* | | ? |
| 38 | *Cohors duodecima Valeria* | *Afro* | ?Wadi Arabah |
| 39 | *Cohors decima Carthaginensis* | *Cartha* | ?Wadi Arabah |
| 40 | *Cohors prima argentenaria* | *Tarba* | Udhruh area? |
| 41 | *Cohors quarta frygum* | *Praesidio* | Khirbat El Khalde |
| 42 | *Cohors secunda Gratiana* | *Iehibo* | ?Wadi Arabah |
| 43 | *Cohors prima equitata* | *Calamona* | Bir Madhkur? |
| 44 | *Cohors secunda Galatarum* | *Arieldela* | Gharandal |
| 45 | *Cohors prima Flavia* | *Moleatha* | Ain Hosb? |
| 46 | *Cohors quarta Palaestinorum* | *Thamana* | Qasr Al Juheiniye |
| 47 | *Cohors secunda Cretensis* | *iuxta Iordanem fluvium* (, near to the River Jordan) | Tower on Jordan in Madaba Map |
| 48 | *Cohors prima salutaria* | , *inter Aeliam et Hierichunta* (, between Jerusalem and Jericho) | Qala'at ed Damm |

Table 7 *Notitia Dignitatum, Oriens XXXIV Dux Palaestinae*

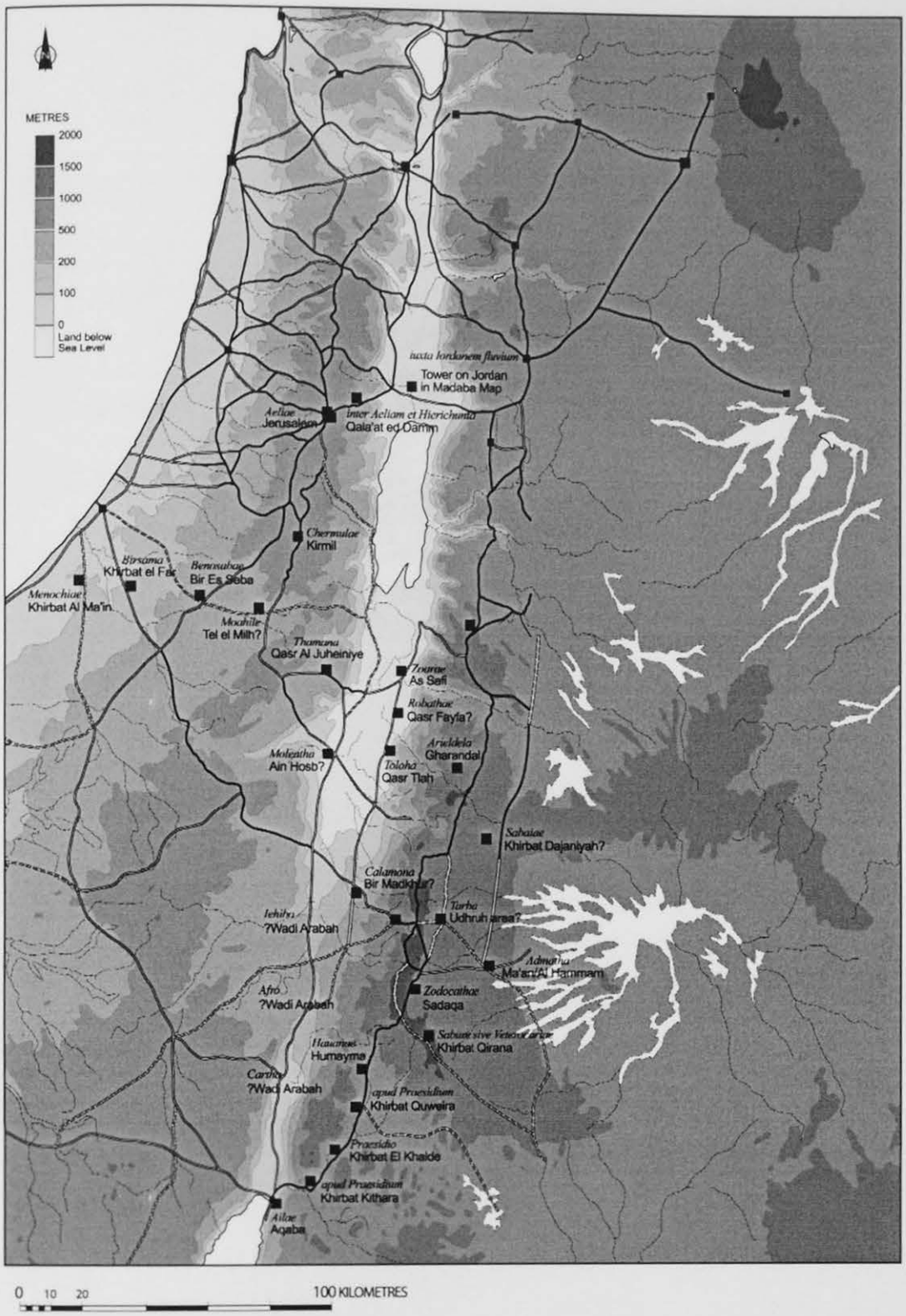



Figure 28 Modern locations of sites noted in *Notitia Dignitatum*


Figure 29 Detail of tower in Madaba Map. *From Donner 1992*

| Name | Inscription No. | Palaestina I, II or III | Modern Name |
|---|---|---|---|
| Αβαδ? | Ins. 3, Frag. I, VIII | ? | ? |
| Αδαρα | Ins. 3, Frag. I, VIII | ? | ? |
| Άδροα | Ins. 2, Frag. V | III | Udhruh |
| Αειν? | Ins. 3, Frag. I, VIII | ? | ? |
| Αιλια | Ins. 3, Frag. I, VIII | I | Jerusalem |
| Αιναυαθα | Ins. 2, Frag. V | III | Aina |
| Αμμαθα | Ins. 2, Frag. V | III | Ma'an area |
| Άφρο | Ins. 2, Frag. V | III | ?Wadi Arabah |
| Αρέοπολις | Ins. 3, Frag. I, VIII | III | Er Rabba |
| Άριδδήλα | Ins. 2, Frag. V | III | Gharandal |
| ?οριου Άρινδήλων | Ins. 4, Frag. II, III, IV | III | ?in territory of Gharandal |
| Αρνωνασ | Ins. 3, Frag. I, VIII | III | Wadi Mujib area |
| Άσοα | Ins.1, Frag. VI | ? probably I or III | ? |
| Άσουδα | Ins.1, Frag. VI | ? probably I or III | ? |
| Άυαρα | Ins. 2, Frag. V | III | Humamya |
| Βητοωρο | Ins. 3, Frag. I, VIII | III | El-Lejjun |
| Διοχαισαρειας | Ins. 3, Frag. I, VIII | II | Saffuriye |
| Φτεου? | Ins. 3, Frag. I, VIII | ? | ? |
| Έλλεβανα | Ins. 2, Frag. V | III | ?Bir Madhkur |
| Ελουσα | Ins.1, Frag. VI | III | Khalasa |
| Έισεβα | Ins. 2, Frag. V | III | ?Wadi Arabah |
| Γισχαλα | Ins. 3, Frag. I, VIII | II | Jish |
| απο του Ιορδανου | Ins. 3, Frag. I, VIII | I | Tower on Jordan |
| Μάμψις? | Ins.1, Frag. VI | III | Kurnub |
| Μωα | Ins. 2, Frag. V | III | Ain Hosb |
| [τού πραιτω]ριου Μοβηνων | Ins. 3, Frag. I, VIII | III | Qasr Bshir |
| Νεον Καστρν | Ins. 3, Frag. I, VIII | I? | Qala'at ed Damm? |
| ?οριου Πετρων | Ins. 4, Frag. II, III, IV | III | ?in territory of Petra |
| Φαινων | Ins. 2, Frag. V | III | Khirbat Faynan |
| Πραισιδιυμ | Ins. 2, Frag. V | III | Mezad Zohar? |
| Ροβαθα | Ins. 2, Frag. V | III | Qasr Fayfa |
| Σεβασατης | Ins. 3, Frag. I, VIII | I | Sebastiya |
| Σοβαεια | Ins. 2, Frag. V | III | Khirbat Dajaniyah? |
| Καρκαρια | Ins. 2, Frag. V | III | Khirbat Qirana? |
| Σαλτων? | Ins.1, Frag. VI | ? probably I or III | Estate? |
| Σαλτον | Ins. 4, Frag. II, III, IV | ? probably I or III | Estate? |
| Σαλτων Κωνσταντιανιχης | Ins. 4, Frag. II, III, IV | I | Part of Estate near Khirbat El Far |
| Σιρθα | Ins. 2, Frag. V | III | ?Wadi Arabah |
| Θομαρα | Ins. 2, Frag. V | III | Qasr el Juheiniye |
| Τερεβινθος | Ins. 4, Frag. II, III, IV | I | Haram Ramat Al-Halil |
| Τολοανα | Ins. 2, Frag. V | III | Qasr Tlah |
| Ζοορα | Ins.1, Frag. VI | III | As Safi |
| Ζαδακαθα | Ins. 2, Frag. V | III | Sadaqa |

Table 8 Beer Sheva Edict

| Line number | Ancient Name | Tax sum | Modern Name |
|---|---|---|---|
| 1 | Adroa | 65 | Udhrun |
| 2 | Auara | 43 | Humamya |
| 3 | Zadakatha | 32 | Sadaqa |
| 4 | Ammatha | 24 | Ma'an/Al Hamamam |
| 5 | Ariddela of G? | ? | Gharandal |
| 6 | Karkaria | 15 | Khirbat Qirana? |
| 7 | Sobaeia in territory of Ariddela | ? | Khirbat Dajaniyah? |
| | | | |
| 8 | Robatha | 43 | Qasr Fayfa? |
| 9 | Ellebana | 36 | Bir Madhlur? |
| 10 | Aphro | 24 | ? |
| 11 | Sirtha | 15 | ? |
| 12 | Phaino | 15 | Khirbat Faynan |
| 13 | Moa | 15 | Ain Hosb? |
| 14 | Toloana | 15 | Qasr Tlah |
| 15 | Eiseiba | 15 | ? |
| 16 | Praesidium | 12 | Mezad Zohar |
| 17 | Thomara | 5 | Qasr Al Juheiniye |
| | | | |
| 18 | Ainauatha | 20 | Aina |

Table 9 Beer Sheva Edict, Inscription 2 (Fragment V)

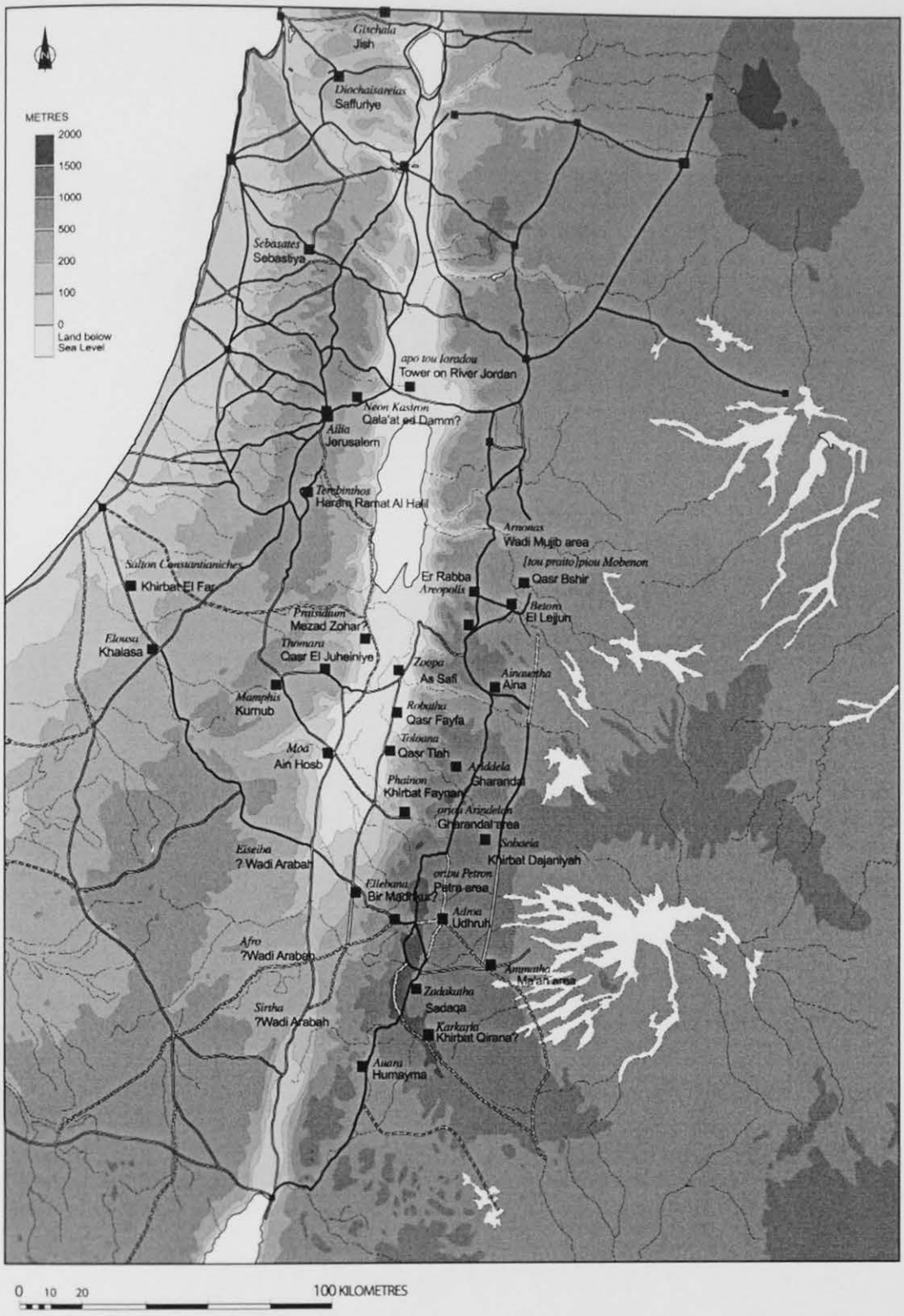



Figure 30 Modern location of sites noted in Beer Sheva Edict

| Name | P.Colt No. | Modern Name |
|---|---|---|
| Birosaba | 39,6,16 | Bir es Seba |
| Birsamis | 39,11 | Khirbat El Far |
| Chermula | 39,5,10 | Kirmil |
| Elusa | 39 | Khalasa |
| Malaatha | 39,7,18 | Tel El Milh |
| Mampsis | 39,4,17 | Kurnub |
| Nessana | 39,14 | Auja El Hafir |
| Oboda | 39,2,13 | 'Abda |
| Sobila | 39,3,15 | Khirbat Az-Zubala |

Table 10 Nessana Papyri

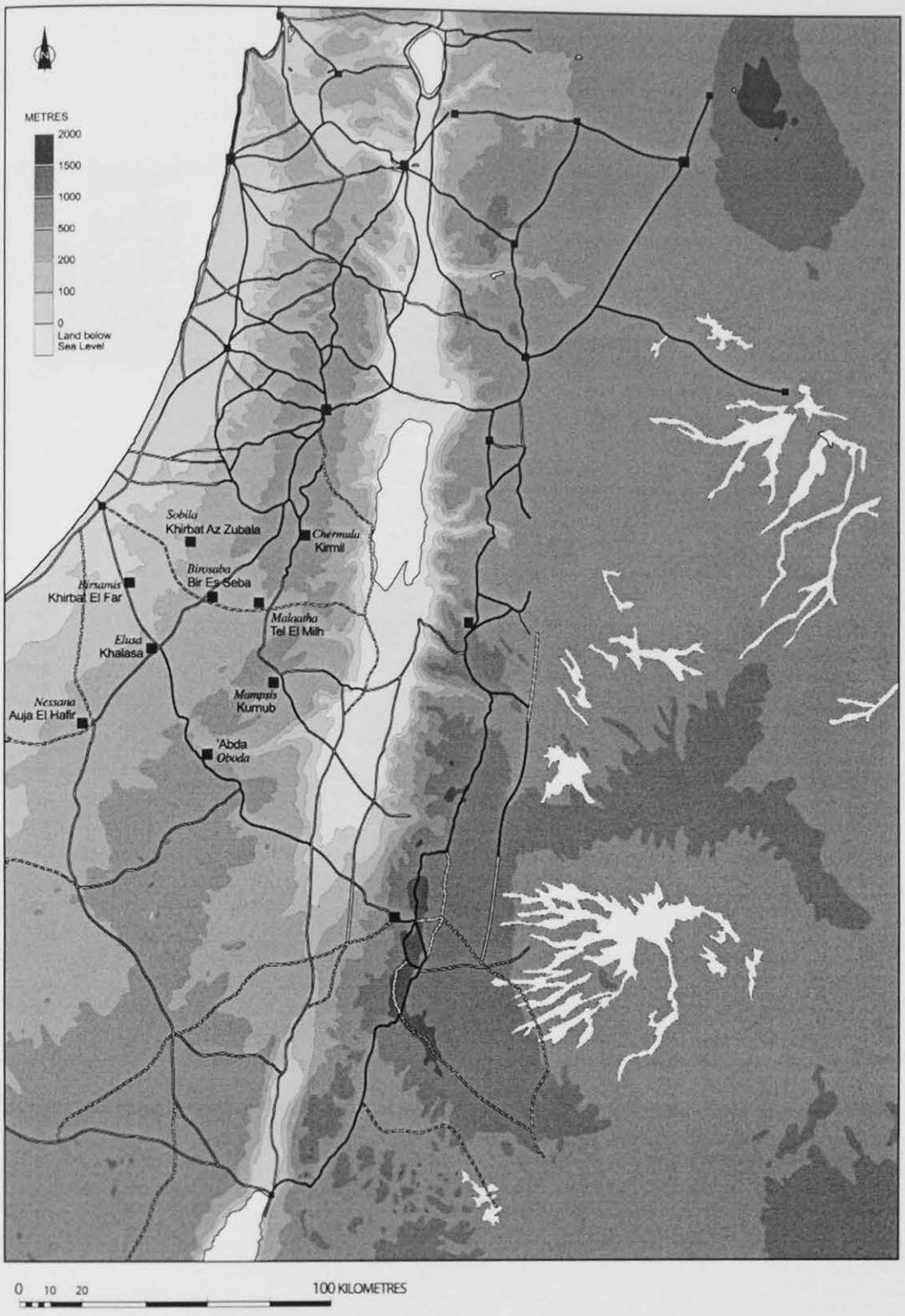



Figure 31 Modern location of sites noted in Nessana Papyri

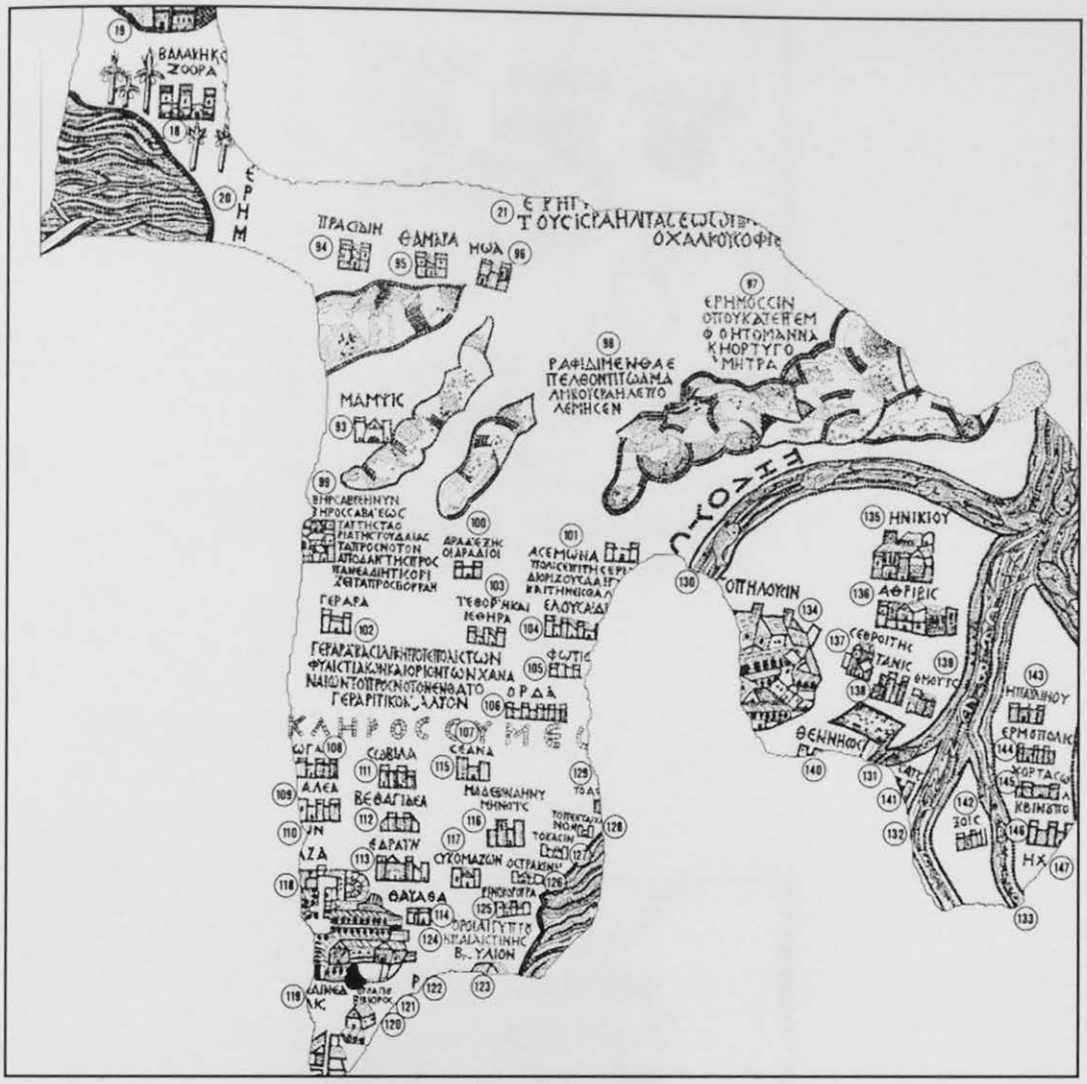


Figure 32 Detail of Southern Jordan and Israel in Madaba Map. *From Donner 1992*

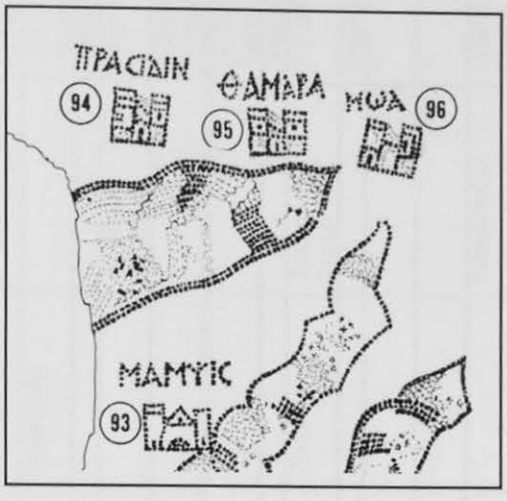



Figure 33 Detail of three military sites in Madaba Map. *From Donner 1992*


Figure 34 Detail of Beer Sheva in Madaba Map. *From Donner 1992*

| Ptolemy (c.150-180AD) | *Tabula Peutingeriana* (c. 200-400) | Eusebius' *Onomastikon* (c. 300AD) | *Notitia Dignitatum* (c. 400AD) | Beersheva Edict (c. 520-540 AD) Nessana papyri (6th AD) | Madaba Map (c. 560 AD) | Hierocles Georgius Cyprius *Palaestina Tertia* (Mid 6th AD) | Modern name |
|---|---|---|---|---|---|---|---|
| | AD DIANAM | | | | | | Timna? |
| Ἄδρου | | | TARBA? | Ἄδροα | | Αυγυστοπολις Αυγουστοπολις | Udhruh |
| Ἔλανα | HAILA | Αιλαμ | AILAE | | | Ελαϛ | Al-Aqaba |
| | | | ADMATHA | Αμματθα | | | Ma'an area |
| Ἱεροσόλυμα Αἰλία Καπιτωλία | AELIA | Ἱεροσαλήμ | AELIAE | Αιλια | Ἱεροσαλήμ | | Jerusalem/ Al-Quds |
| | | | AFRO | Ἄφρο | | | ? Wadi Arabah |
| | | | ARIELDELA | Ἀριδδήλα | | Ἀριν̈δελα Ἀριν̈δήλα | Gharandal |
| | | | | ?οριου Ἀριν̈δήλων | | | Territory of Gharandal |
| Θάνα Θοανα | THORNIA | | | | | | Et Tuwaneh Dana? |
| Καλγουία | | | TOLOHA | Τολοανα | | | Qasr Et Tlah |
| Ζοαρα | | Ζοορα, Σοορα, Ζωορα | ZOARAE | Ζοορα | Ζοορα | Ζωορα Ζωορα | As Safi |
| Ζαναααθα | ZADAGATTA | | ZODOCATHAE | Ζαδακαθα | | | Sadaqa |
| | | | Ala Idiota Constituta | | | | ? |
| | | | luxta Iordanem fluuium | απο του Ιορδανου | Tower | | ? |
| | | Μαλεδομνα | Inter Aeliam et Hierichunta | | | Maledomnei | Qala'at ed Damm |

Table 11
Correlation of ancient site names of *Arabia*

| Ptolemy (c.150-180AD) | *Tabula Peutingeriana* (c. 200-400) | Eusebius' *Onomastikon* (c. 300AD) | *Notitia Dignitatum* (c. 400AD) | Beersheva Edict (c. 520-540AD) Nessana papyri (6th AD) | Madaba Map (c. 550AD) | Hierocles Georgius Cyprius *Palaestina Tertia* (Mid 6th AD) | Modern name |
|---|---|---|---|---|---|---|---|
| | AD DIANAM | | | | | | Timna? |
| Ἄδρου | | | TARBA? | Ἄδροα | | Ἀυγυστοπολις<br>Ἀυγουστοπολις | Udhruh |
| Ἔλάνα | HAILA | Αιλαμ | AILAE | | | Ελας | Al-Aqaba |
| | | | ADMATHA | Αμμαθα | | | Ma'an area |
| Ἱεροσόλυμα Αἰλία Καπιτωλία | AELIA | Ἱεροσαλήμ | AELIAE | Αιλια | Ἱεροσαλήμ | | Jerusalem/ Al-Quds |
| | | | AFRO | Ἄφρο | | | ? Wadi Arabah |
| | | | ARIELDELA | Ἀριδδήλα | | Ἀρινδελα<br>Ἀρινδήλα | Gharandal |
| | | | | ?οριου Ἀρινδήλων | | | Territory of Gharandal |
| | RABABATORA | | AREOPOLI<br>Not Dig Or 34.17 | Ἀρέοπολις | | Αρεοπολις<br>Αρεοπολις | Er-Rabba |
| | | | | Ἀσοα | | | ? |
| | | | ASUADA | Ἀσουδα | | | ? |
| Βέρζαμμα | | | BIRSAMA | Birsamis | Saltus Geraritícus | Birsama | Khirbat El Far |
| Ἀυαρα | HAUARRA | | HAUANAE | Ἀυαρα | | | Humamya |
| | | Βηρσαβεέ | BENOSABAE | Birosaba | Βηροσσαβα | Βιροσάβων | Bir Es Seba |
| | | | BETTHORO<br>Not Dig Or 34.17 | Βητοωρο | | Βιτάρους | El-Lejjun |
| | | | CARTHA | Σιρθα | | | ? Wadi Arabah |
| | | Χερμαλα | CHERMULAE | Chermula | | Chermela | El-Kirmil |
| Εβοδα | OBODA | | | Oboda | | | 'Abda |
| Ἐλουσα | ELUSA | | | Ἐλουσα<br>Elusa | Ἐλουσα | Ἐλουσα<br>Ἐλουσα | Khalasa |
| | | | HASTA | | | | ? |
| | | | IEHIBO | Ἐισειβα | | | ? Wadi Arabah |
| | | | IOTABE | | | | Island of Tiran |
| Γυψαρία | GYPSARIA | | | | | | ?Khirbat Gharandal |
| Λύσα | LYSA | | CALAMONA? | Ἐλλεβανα? | | | ?Bir Madhkur |
| Μαψ | | Μάψις | | Μάμψις?<br>Mampsis | Μαμψις | Μαμψις<br>Μαψις | Kurnub |
| | | Μηνοῖς | MENOCHIAE | Σαλτων Κωνσταντιανιχης | Μηνοῖς | Σαλτων Κωνσταντιανιχης | Khirbat Al Ma'in |
| | | Μαλααθα | MOAHILE | Malaatha | | | Tell el Milh |
| Μαλιάτθα | | | MOLEATHA | Μωα | Μωα | | Ain Hosb |
| Νεχλα | NEGLA | | | | | | Nijil |
| | | | | Nessana | | | 'Auja el Hafir |
| Πετρα | PETRIS | Πετρα | | | | Πετρα<br>Πετραι | Petra |
| | | | | ?οριου Πετρων | | | ?in territory of Petra |
| | | Φαινων | | Φαινων | | | Khirbat Faynan |
| | | | | Πραισιδιυμ | Πρασιδιν | | Mezad Zohar Qasr Ez Zuweira |
| | | | apud PRAESIDIUM | | | | Khirbat Kithara/ Khirbat Quweira |
| | PRAESIDIO | | PRAESIDIO | | | | Khirbat Khlade |
| | | Ροωβωθ | ROBATHA | Ροβαθα | | | Khirbat Fayfa? |
| | | | SABAIAE | Σοβαεια | | | Khirbat Dajaniyah? |
| | | Καρχαρια | SABURE sive VETEROCARIA?? | Καρκαρια | | | Khirbat Qirana |
| Γέρασα | RASA | | | | | | Ain Ghadyan |
| | | | | Σαλτον | | | ? |
| | | | | Σαλτων? | | | ? |
| | | | | Sobila | Σωβιλα | | Khirbat Az-Zubala |
| | | Θαιμαν | | | | Σαλτων<br>Σαλτων ἱερατιχου | Dana area? |
| | | Αρβο | | Τερεβινθος | Αρβο<br>Τερεβινθος<br>Ἡ δρύς Μαμβρη | | Haram Ramat Al-Halil |
| Θομαρα | THAMARO | Θαμαρα | THAMANA | Θομαρα | Θαμαρα | | Qasr el Juheiniye |
| Θάνα Θοανα | THORNIA | | | | | | Et Tuwaneh Dana? |
| Καλγουία | | | TOLOHA | Τολοανα | | | Qasr Et Tleh |
| Ζοαρα | | Ζοορα, Σοορα, Ζωορα | ZOARAE | Ζοορα | Ζοορα | Ζωορα<br>Ζωορα | As Safi |
| Ζαναθα | ZADAGATTA | | ZODOCATHAE | Ζαδακαθα | | | Sadaqa |
| | | | Ala Idiota Constituta | | | | ? |
| | | | Iuxta Iordanem fluuium | απο του Ιορδανου | Tower | | ? |
| | | Μαλεδομνει | Inter Aeliam et Hierichunta | | | Maledomnei | Qala'at ed Damm |

Table 11
Correlation of ancient site names of *Arabia*

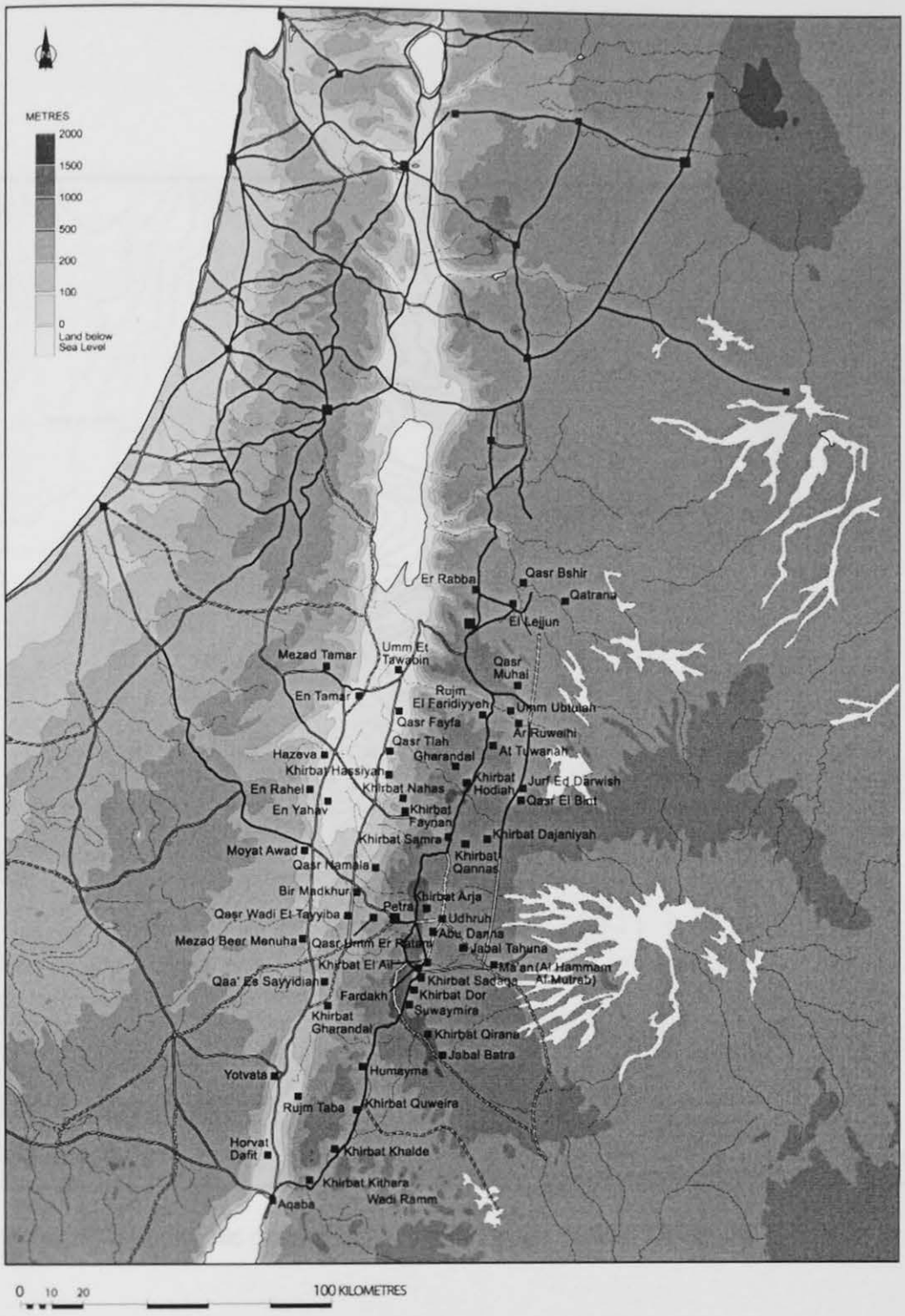



Figure 36 Location of possible military sites in southern Jordan

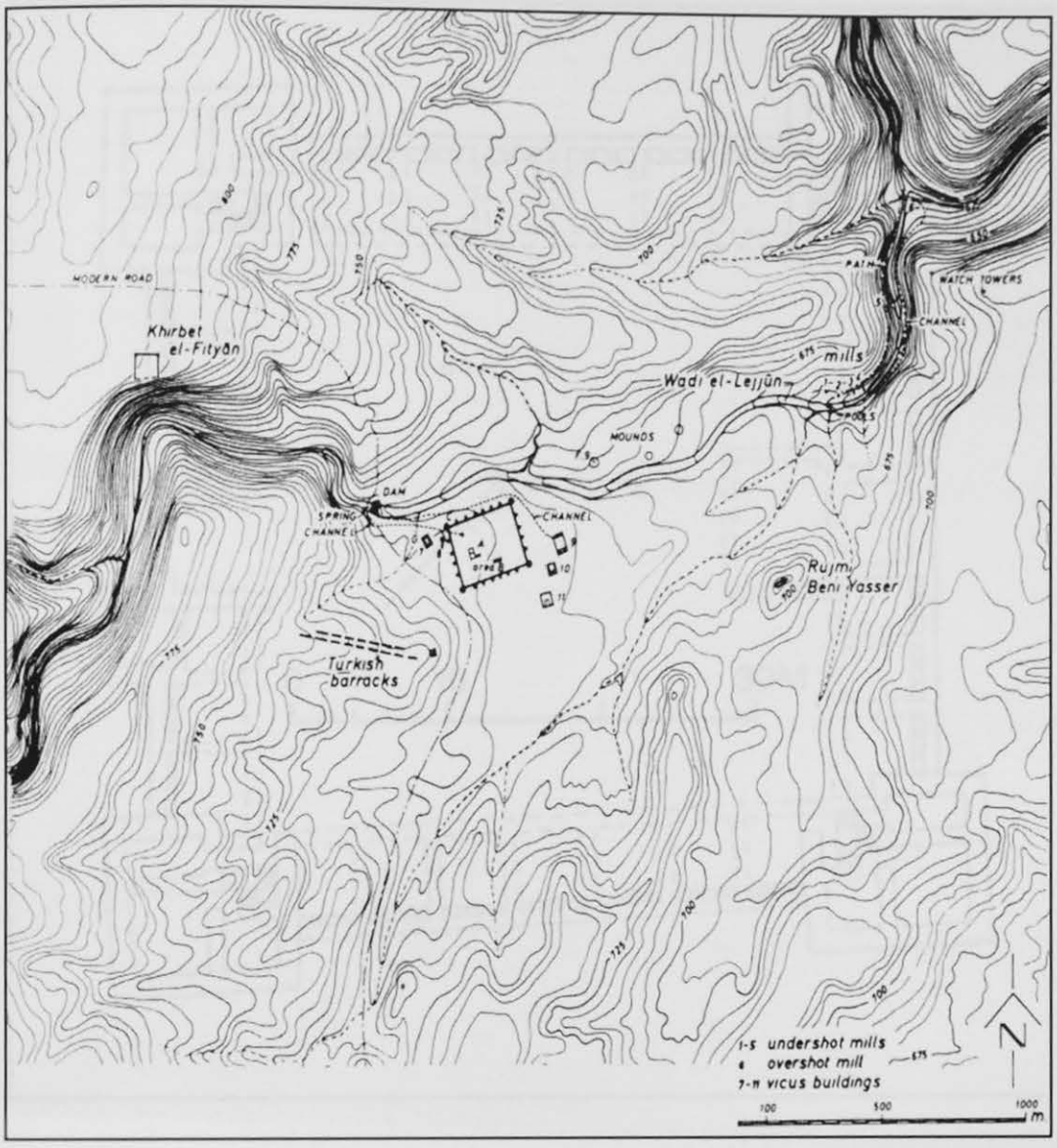



Figure 37 Topographic map of Lejjun. *From Parker 1986a, 75 Fig. 32*

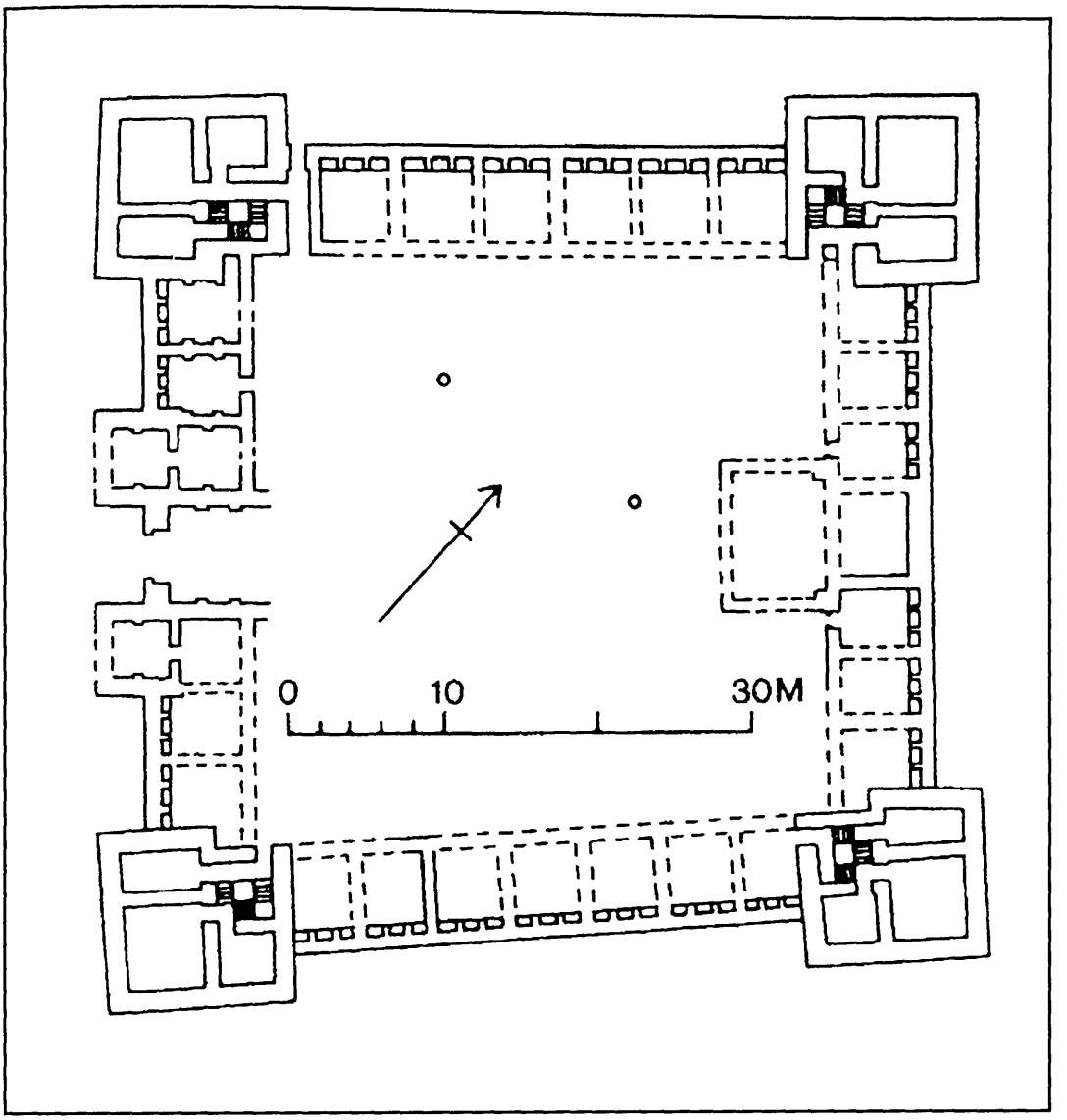



Figure 38 Plan of Qasr Bshir. *From Kennedy 2000, 140 Fig. 14.10*

| Limes Site No | Type | Prehistoric | IA | Nab | Roman | Byz | EI | MI | LI |
|---|---|---|---|---|---|---|---|---|---|
| 117 | Tower | | X | X | X | X | | | X |
| 110 | Tower | | | X | | | | | |
| 105 | Fort | | X | X | | X | X | | X |
| 62A | Tower | | | X | | X | | | |
| 62B | Tower | X | X | X | | X | | | |
| 62D | Fort | X | | X | X | X | | | |
| 68 | Tower | X | | X | X | X | | | |
| 78 | Tower | X | X | | | X | X | | |
| 101 | Tower | X | X | X | | X | | | |
| 120 | Tower | | X | X | X | X | | | X |
| 198 | Tower | | X | X | | X | | | |
| 127 | Tower | | X | X | X | X | | | |

Table 12 Limes Arabicus signalling zone

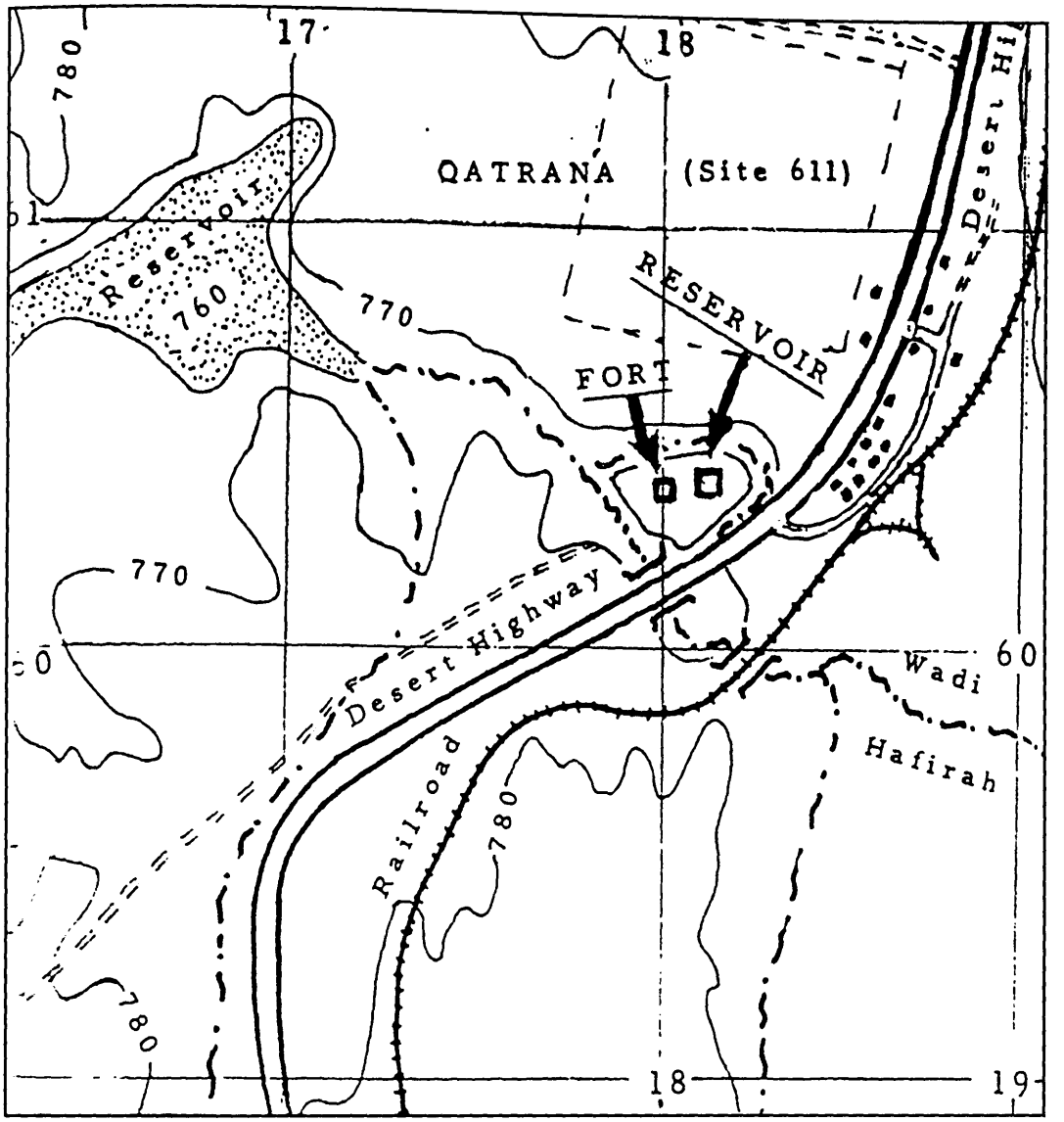



Figure 39 Topographic location of Qatrana. *From Parker 1987a, 73 Fig. 32*

Figure 40 Photo of Muhai. *From Kennedy 2000 Fig. 15.13C*

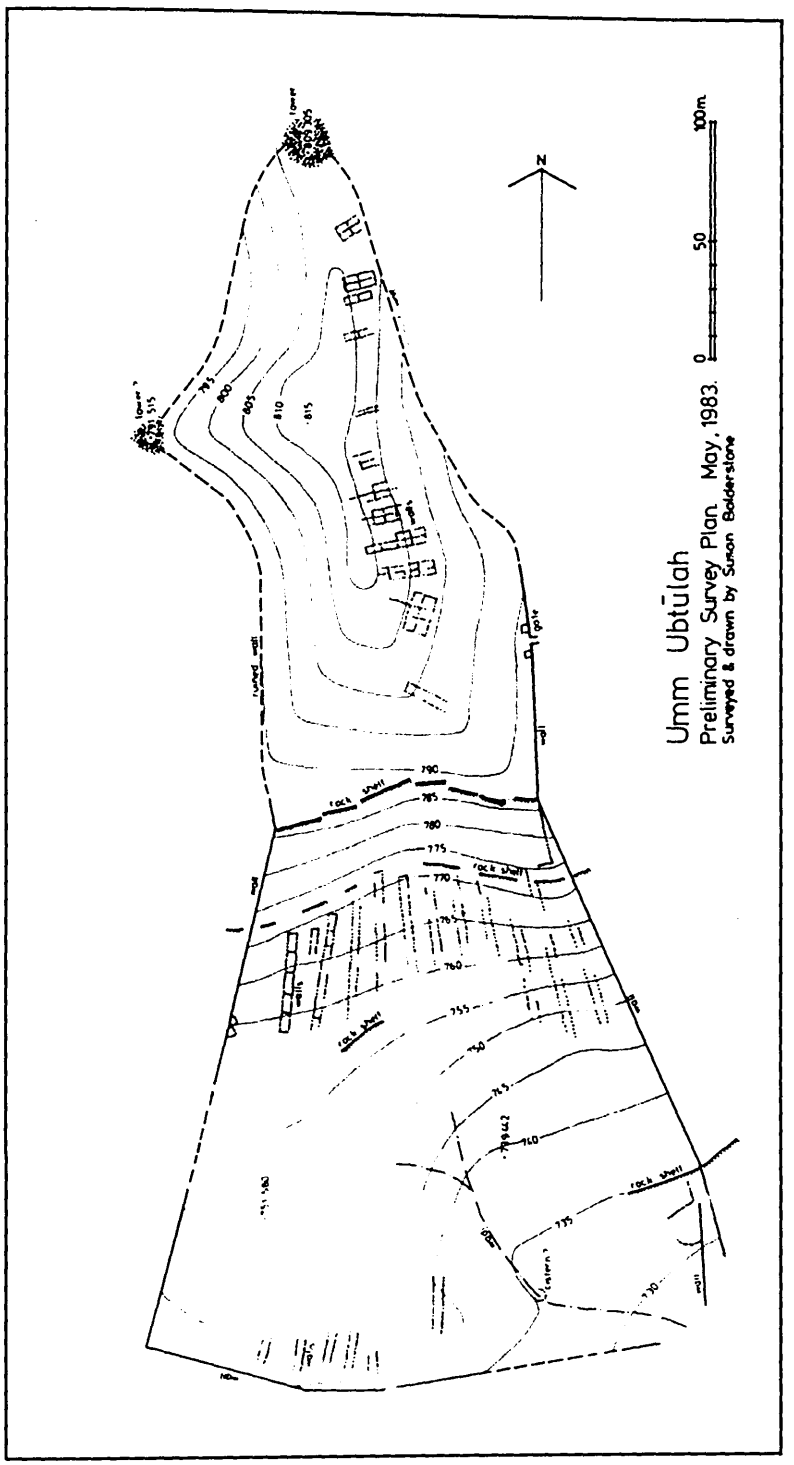



Figure 41 Plan of Umm Ubtulah. *From MacDonald 1988, 294 Fig 75*

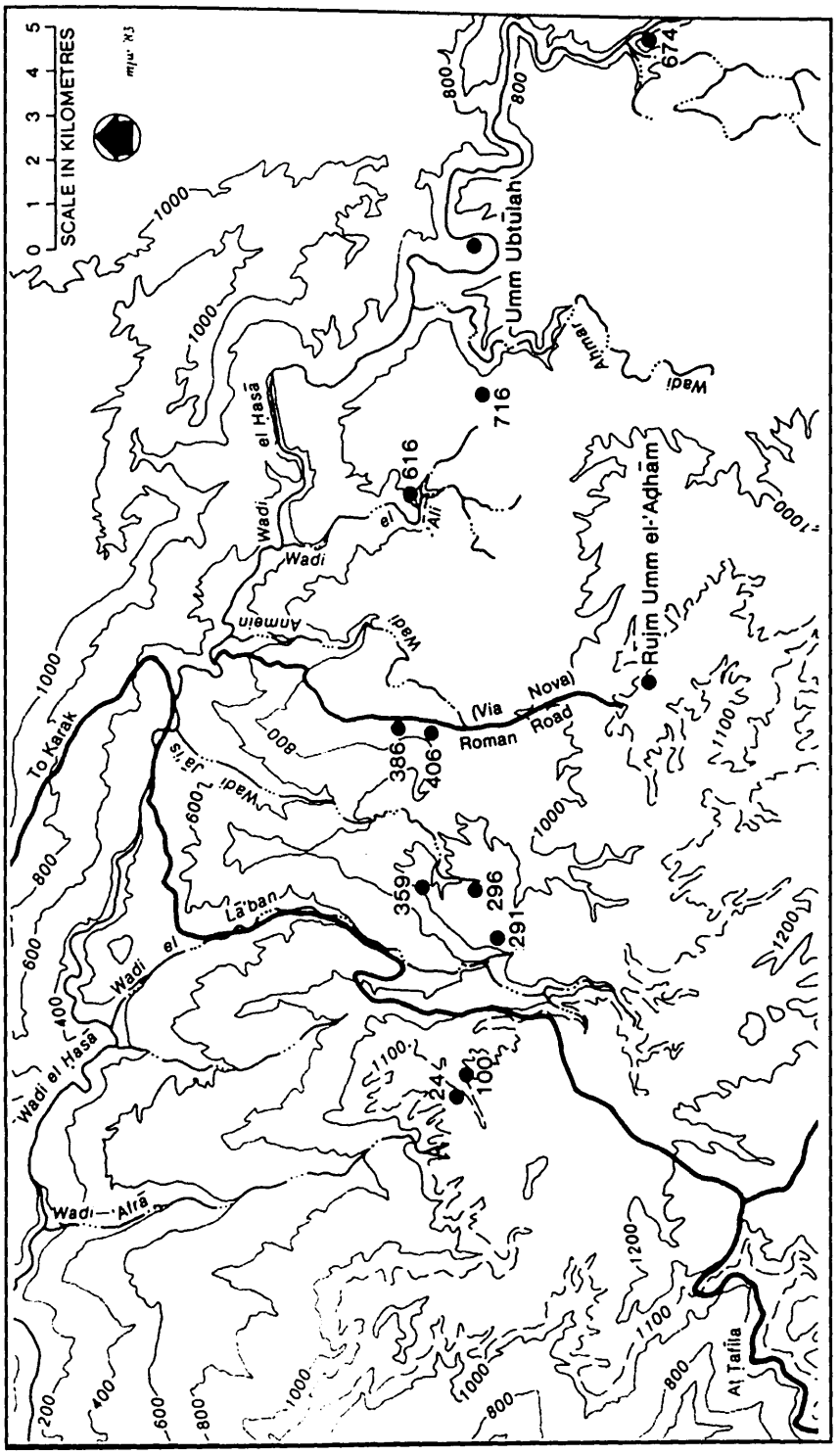



Figure 42 MacDonald's Wadi Hasa military monitoring zone.
*From MacDonald 1988, 293 Fig. 74*

| WHS Site No | Type | Prehistoric | MB | LB | IA | Nab | Roman | Byz | El | Ml | Ll |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 674 | Fort | | | | | X | X | X | | | |
| Umm Ubtulah | Fort?? | X | | | | X | X | | | | |
| 716 | Tower | | | | | | X | | | | X |
| 616 | Fort | X | | | X | X | | X | | | X |
| 406 | Road Station | | | | | X | X | | | | X |
| 386 | Tower? | | | | | X | X | | | | |
| Umm El Adham | Tower | | | | X | X | | | | | |
| 359 | Tower | * | * | * | * | * | * | * | * | * | * |
| 296 | Fort? | | | | | X | | X | | | X |
| 291 | Tower | | | | | X | | | | | X |
| 100 | Tower | | | | | | X | | | | X |
| 24 | Tower | | | | X | | X | X | | X | |

Table 13 WHS fort monitoring zone

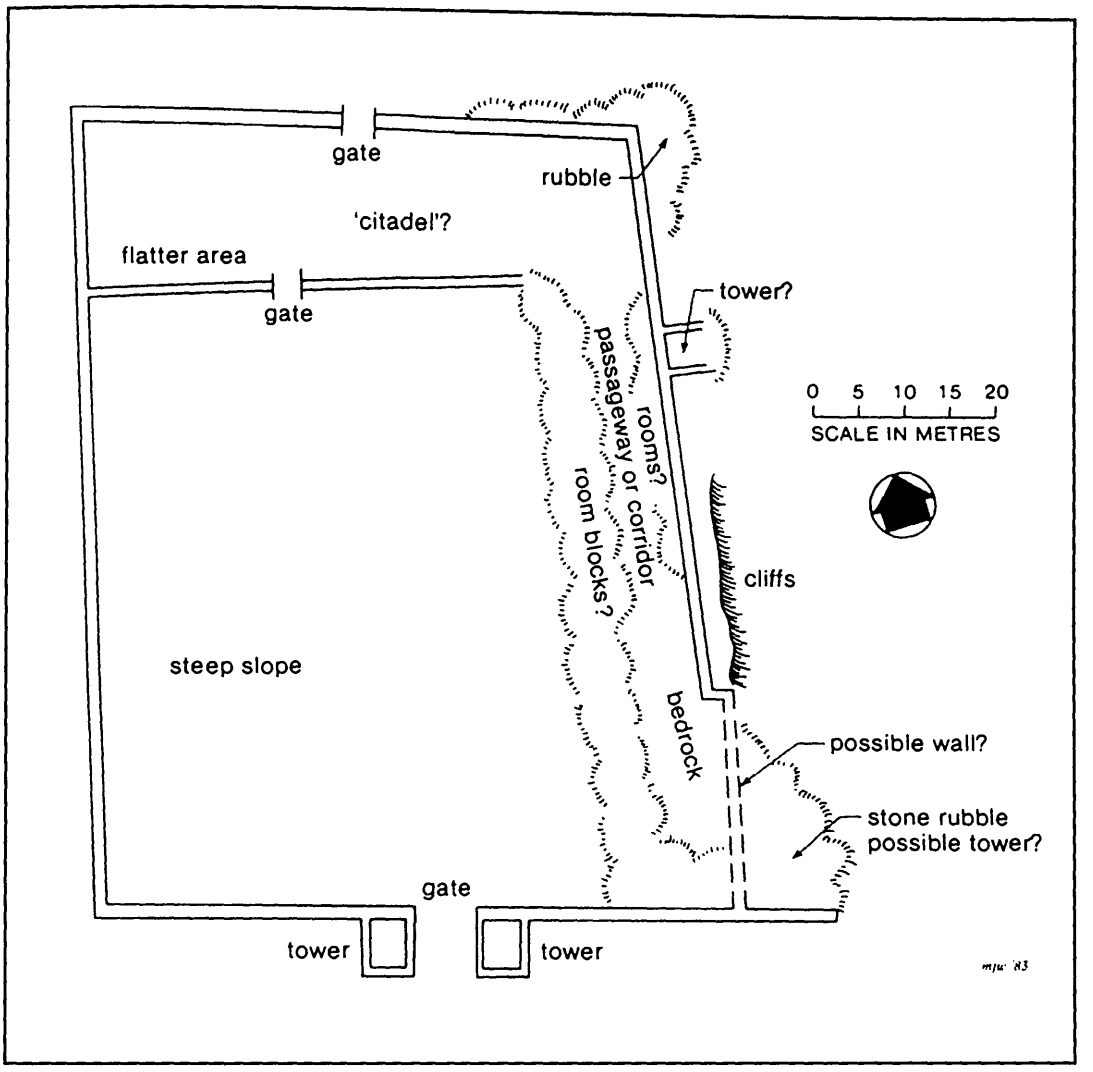



Figure 43 Plan of Ar Ruweihi. *From MacDonald 1988, 211 Fig. 55*

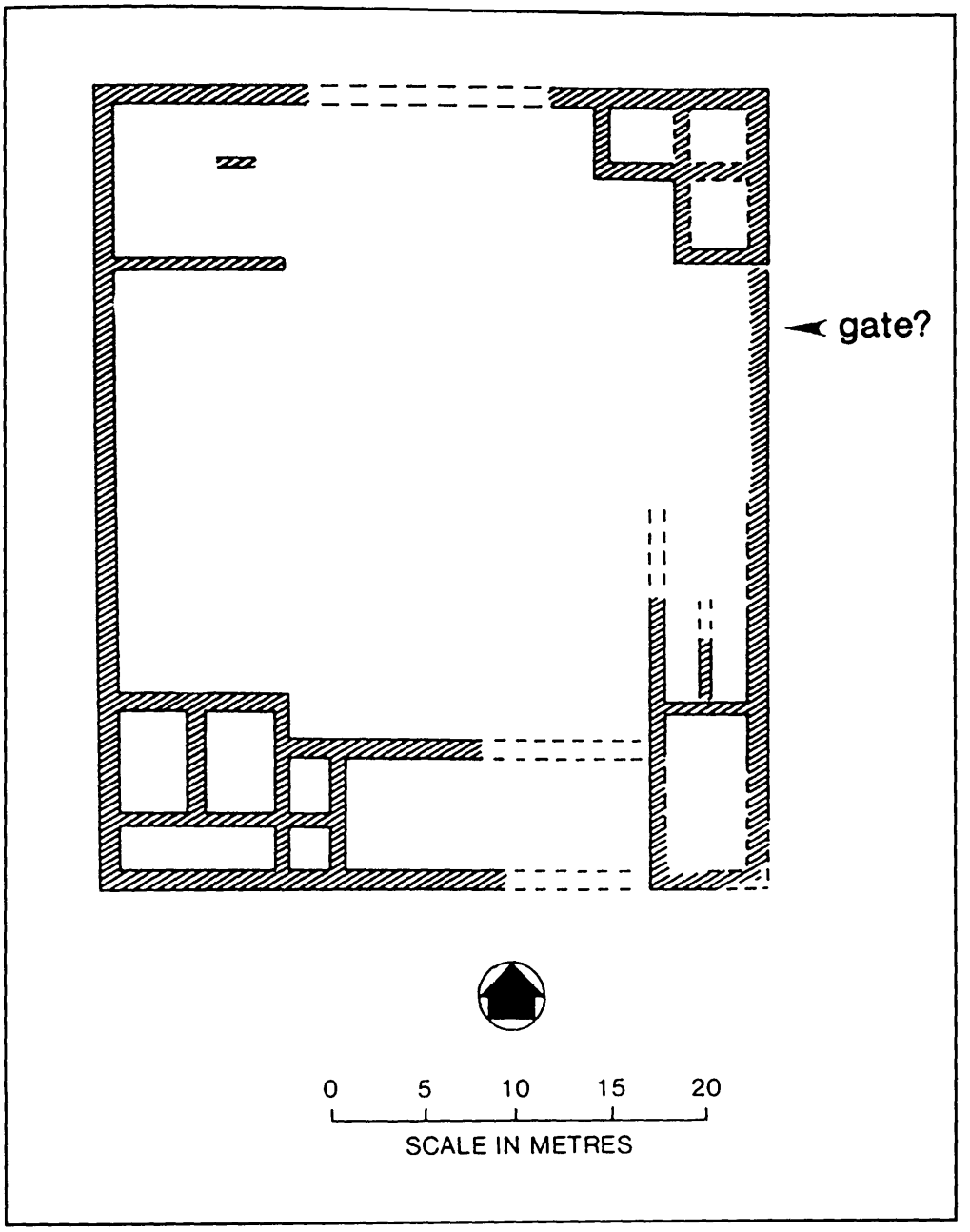



Figure 44 Plan of Rujm Al Faridiyah. *From MacDonald 1988, 227 Fig. 59*

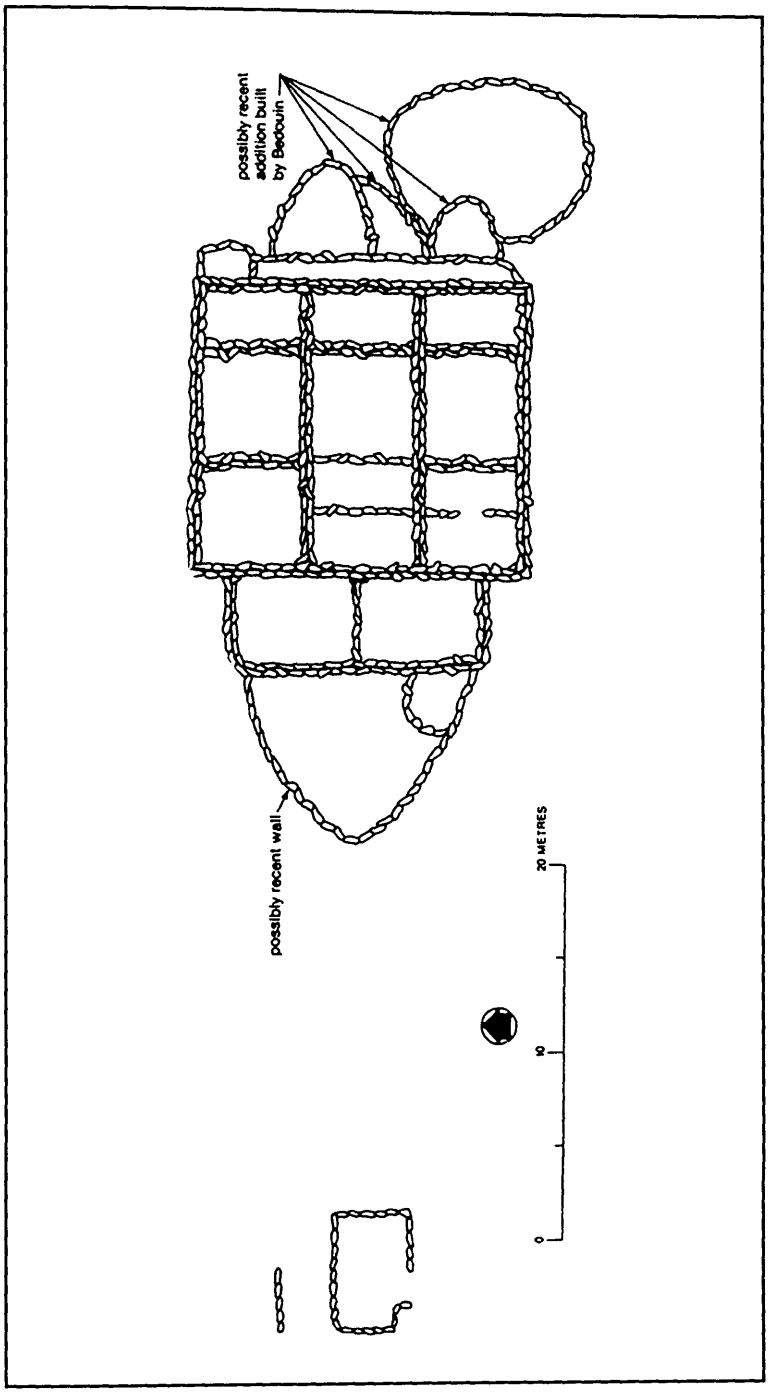



Figure 45 Plan of Al Qasr. *From MacDonald 1988, 133 Fig. 39*

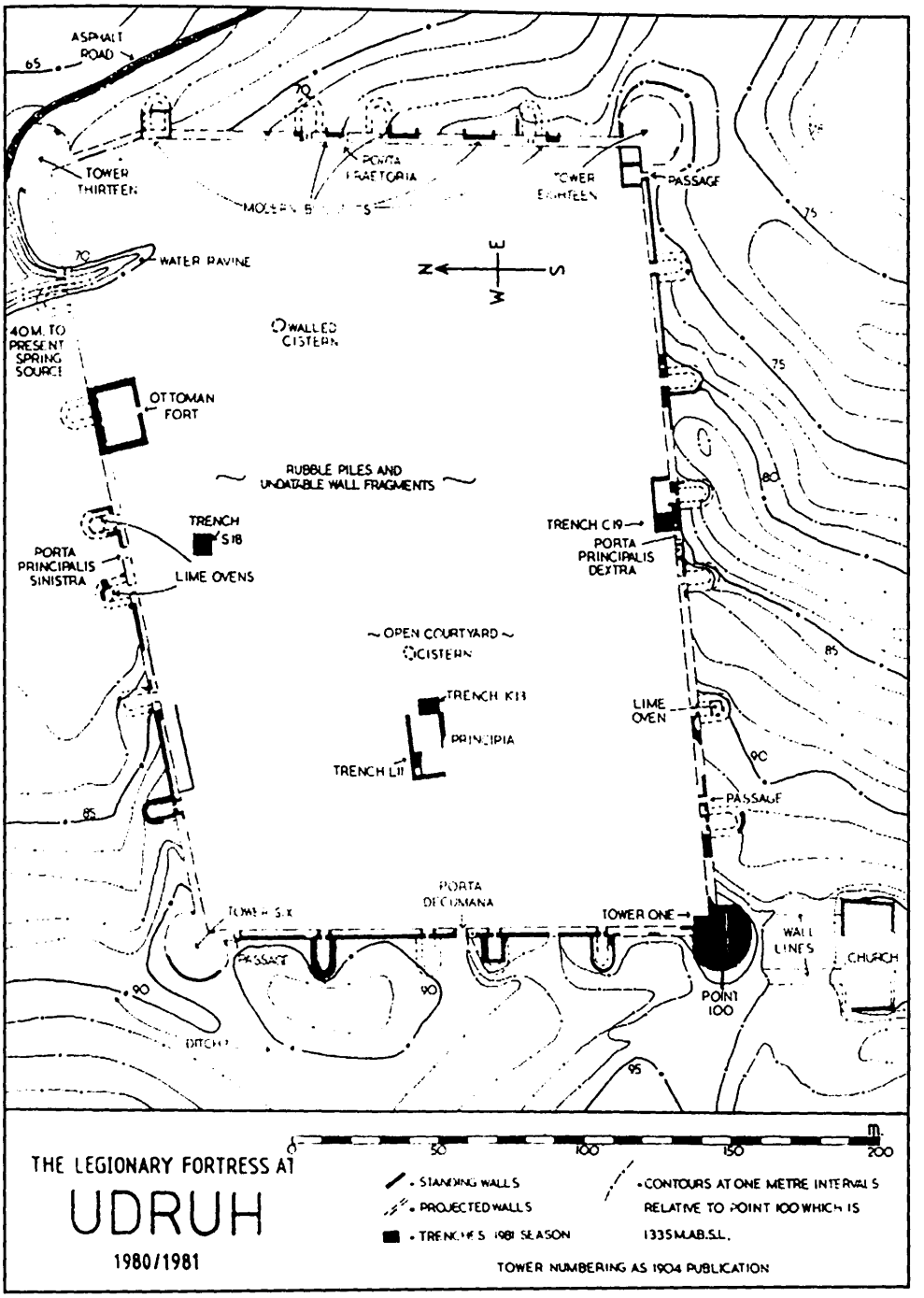



Figure 47 Plan of Udhruh. *From Killick 1983a, 113 Fig.2*

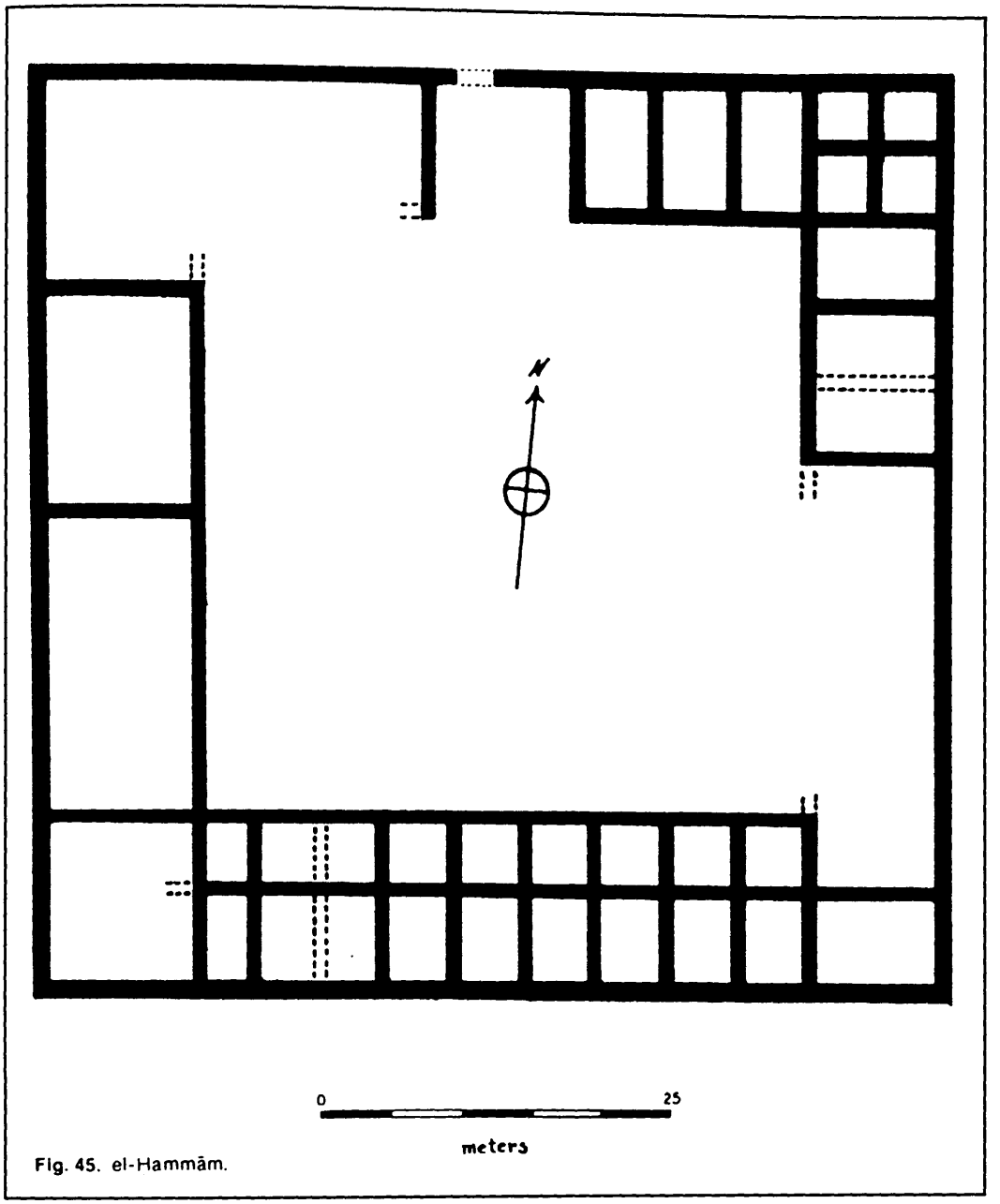


Fig. 45. el-Hammām.

Figure 48 Plan of El Hammam. *From Parker 1986a, 101 Fig 45*

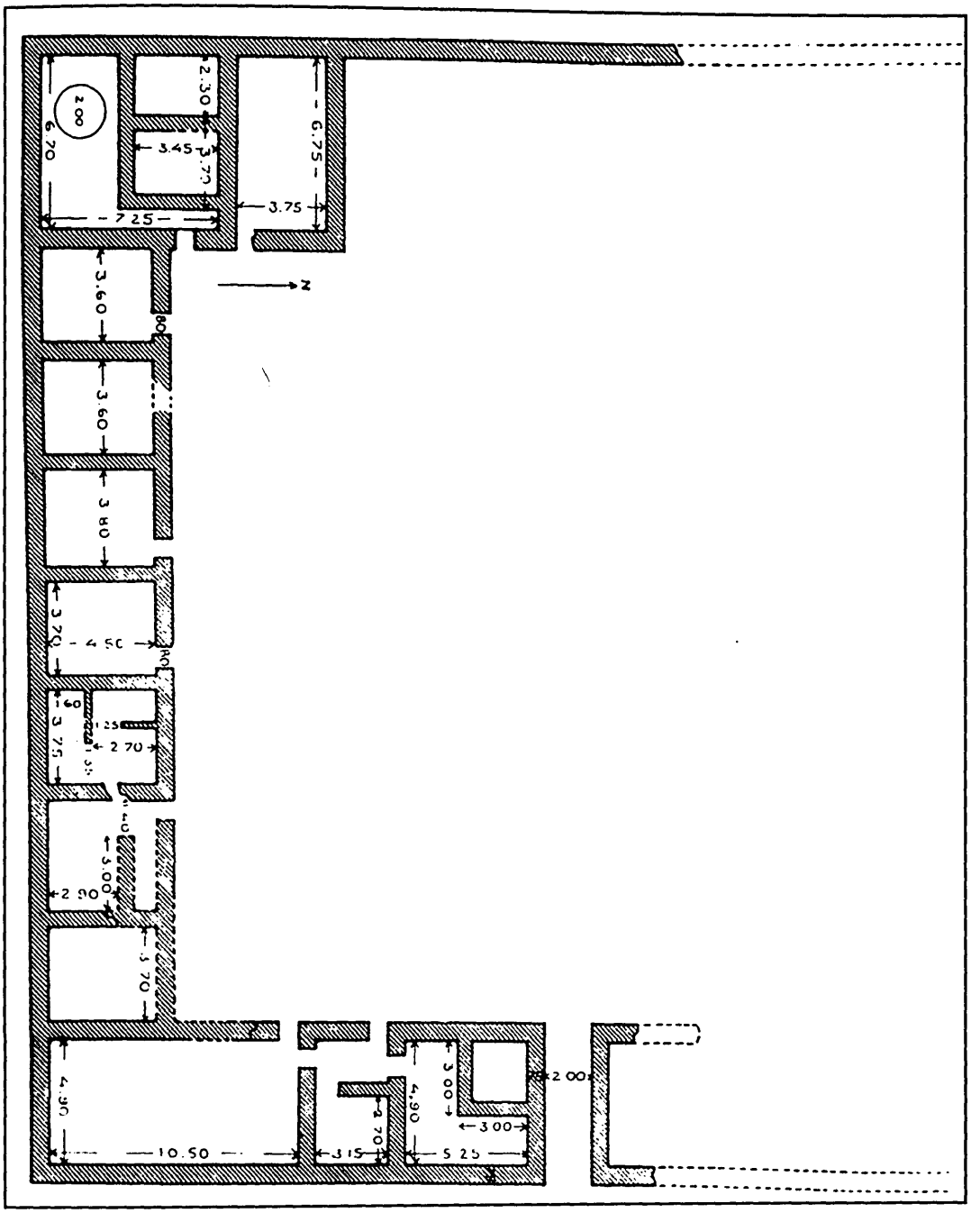



Figure 49 Plan of Khirbat al Mutrab *From Parker 1986a, 103 Fig. 46*

Figure 50 Photo of Jabal Tahuna. *From Kennedy 2000, 172 Fig. 17.8*

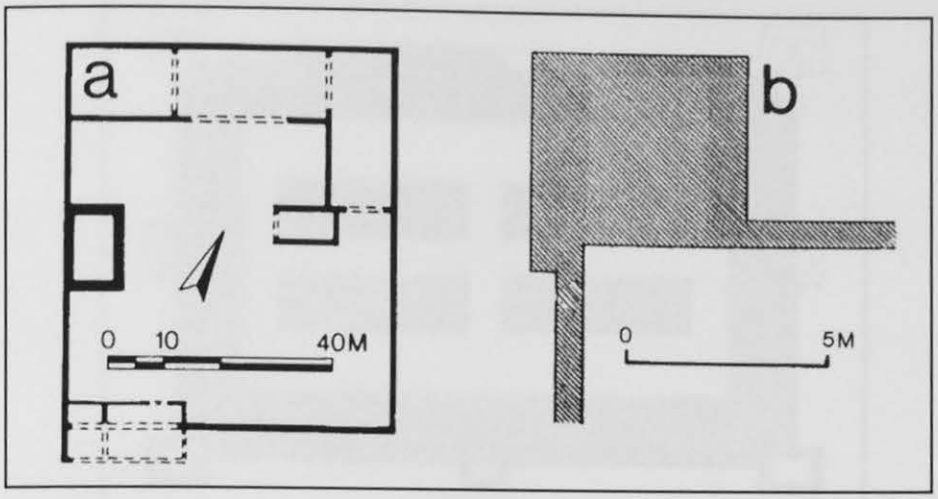



Figure 51 Plan of Khirbat Ail. *From Kennedy 2000, 171 Fig. 17.7*

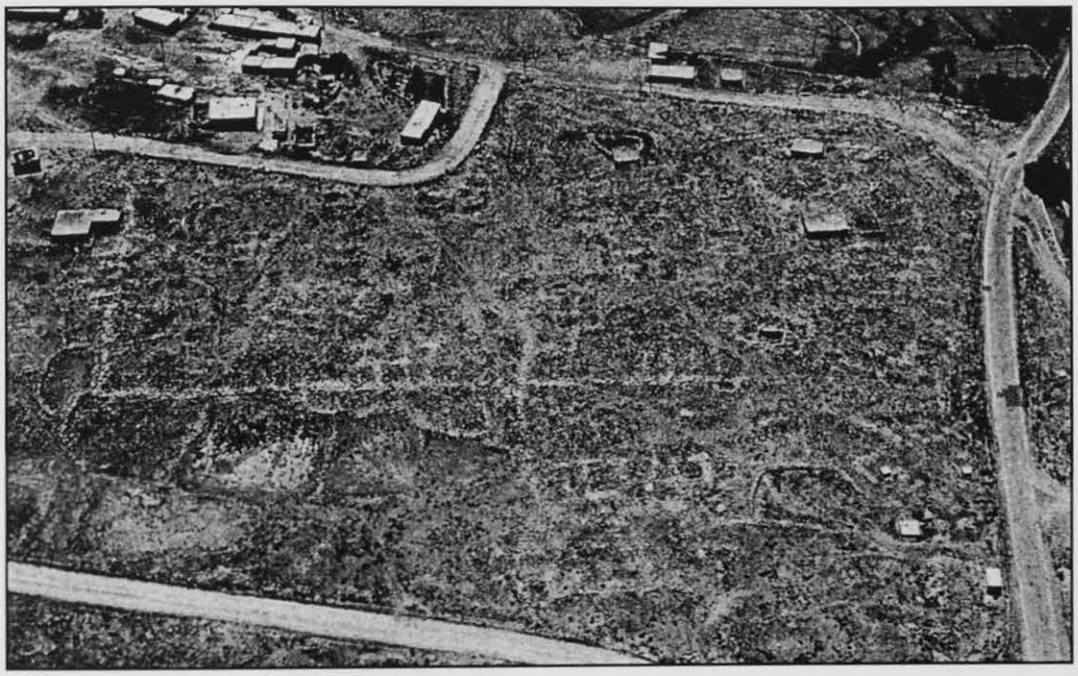


Figure 52 Photo of Khirbat Es Sadaqa. *From Kennedy 2000 Fig. 18.4C*

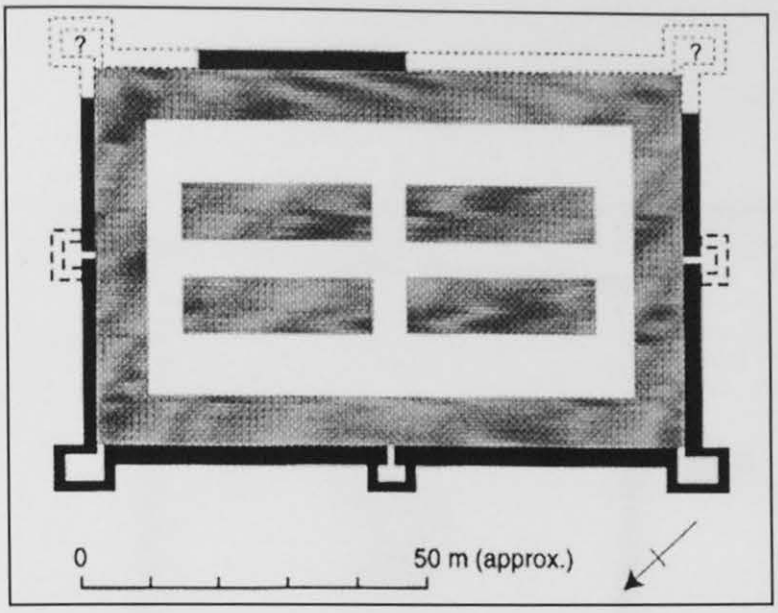



Figure 53 Plan of Khirbat El Qirana. *From Kennedy 2000, 180 Fig. 18.7*

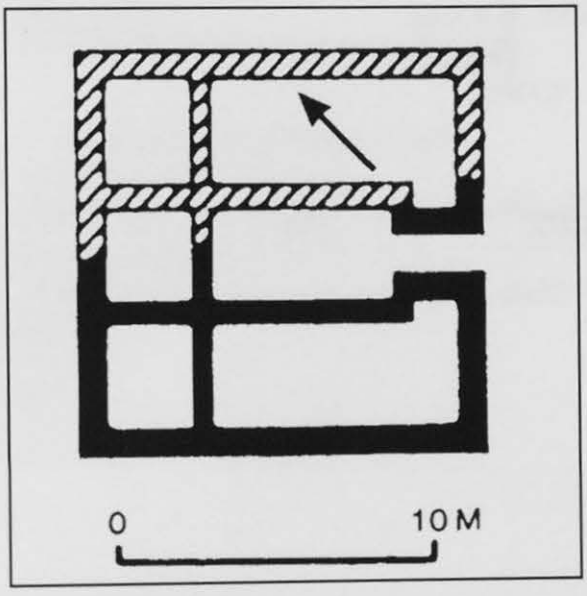



Figure 54 Plan of Batra. *From Kennedy 2000, 180 Fig. 18.8*

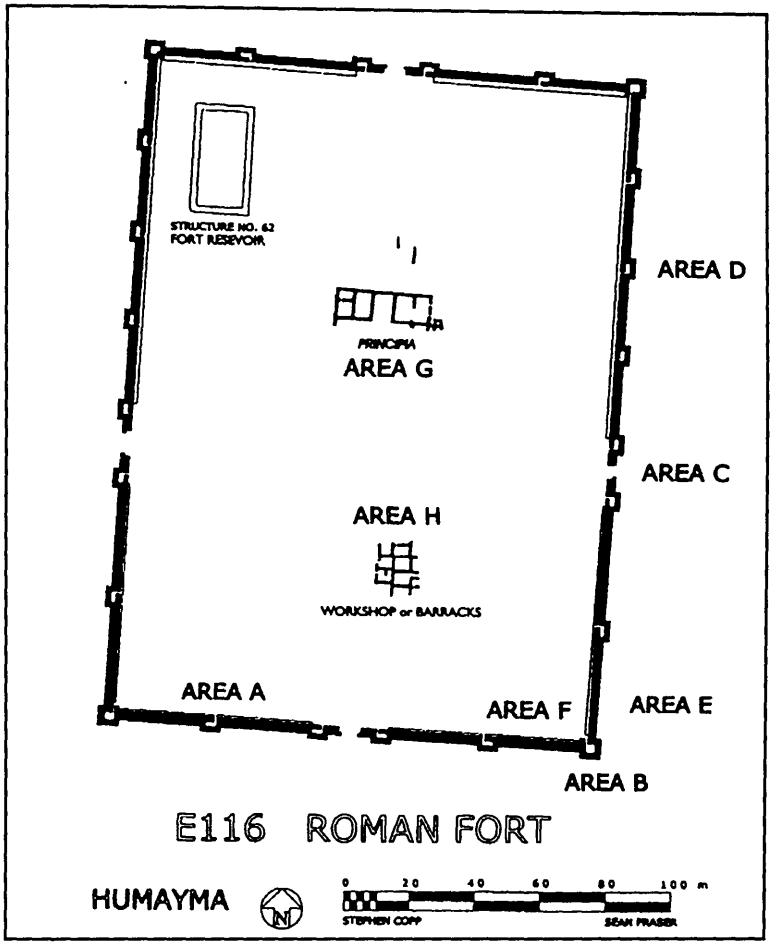



Figure 55 Plan of Humayma. *From Kennedy 2000, 185 Fig. 19.5*

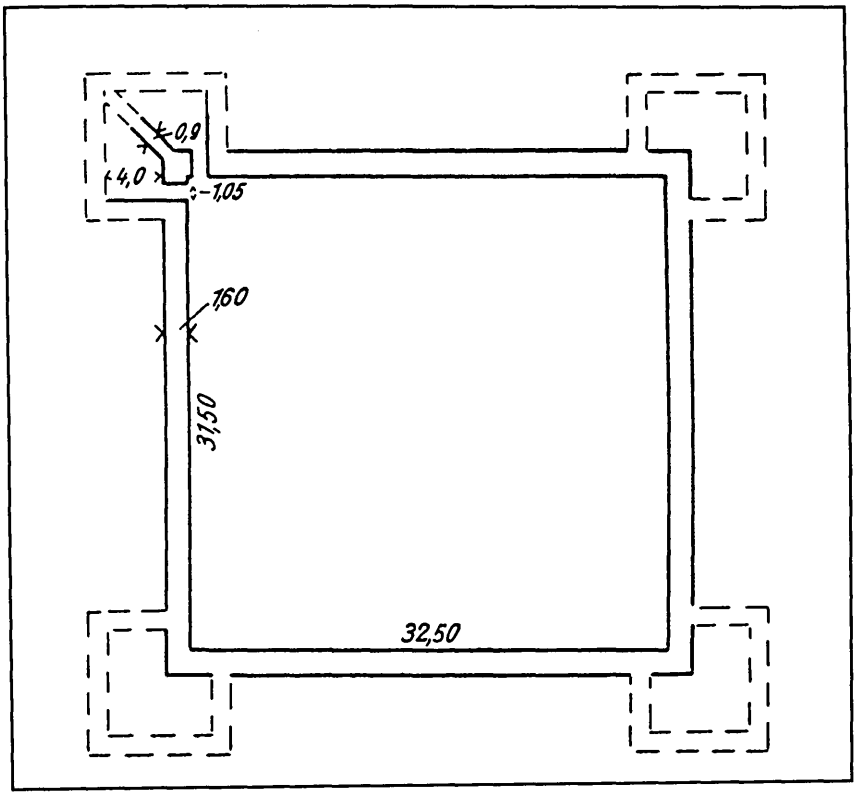



Figure 56 Plan of Khirbat Quweira (Scale 1:500). *From Alt 1936, 97 Abb. 2*

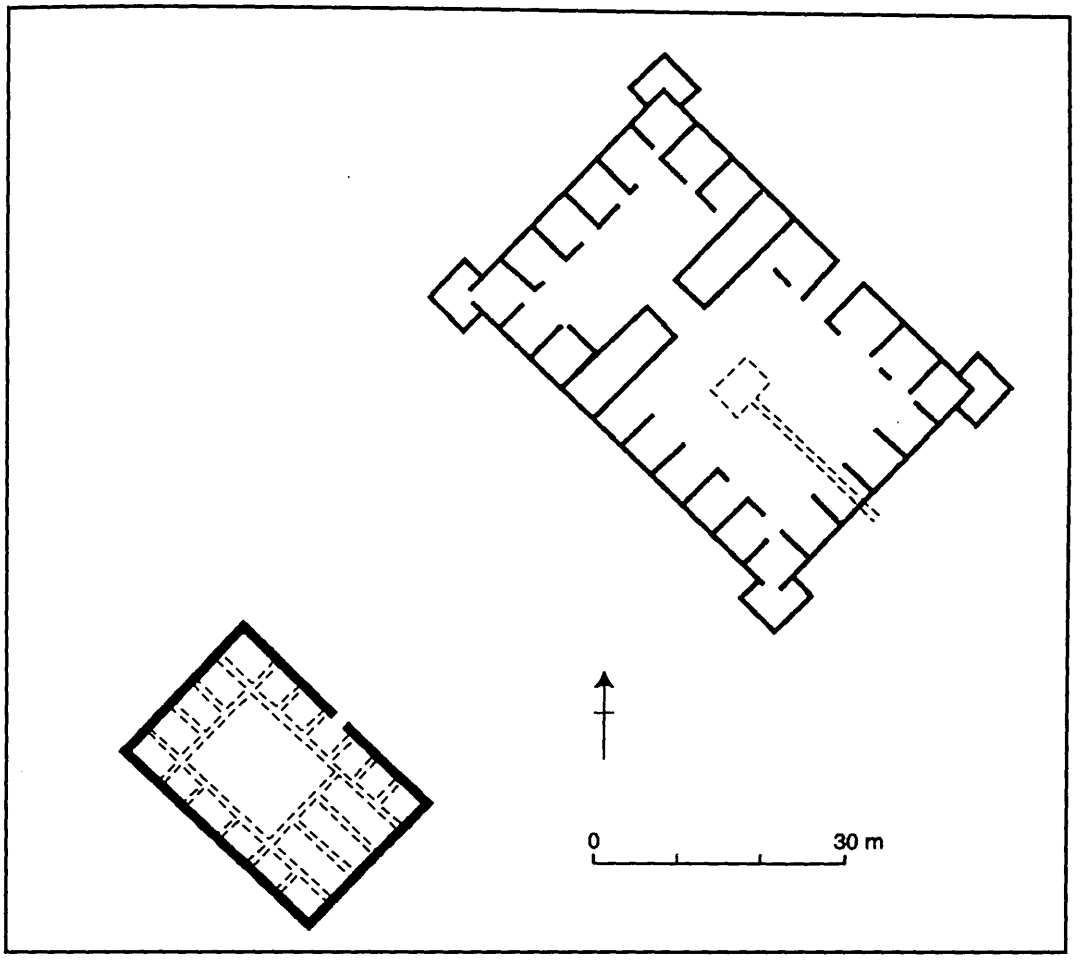



Figure 57 Plan of Khirbat Khalde. *From Kennedy 2000, 188 Fig. 19.10*

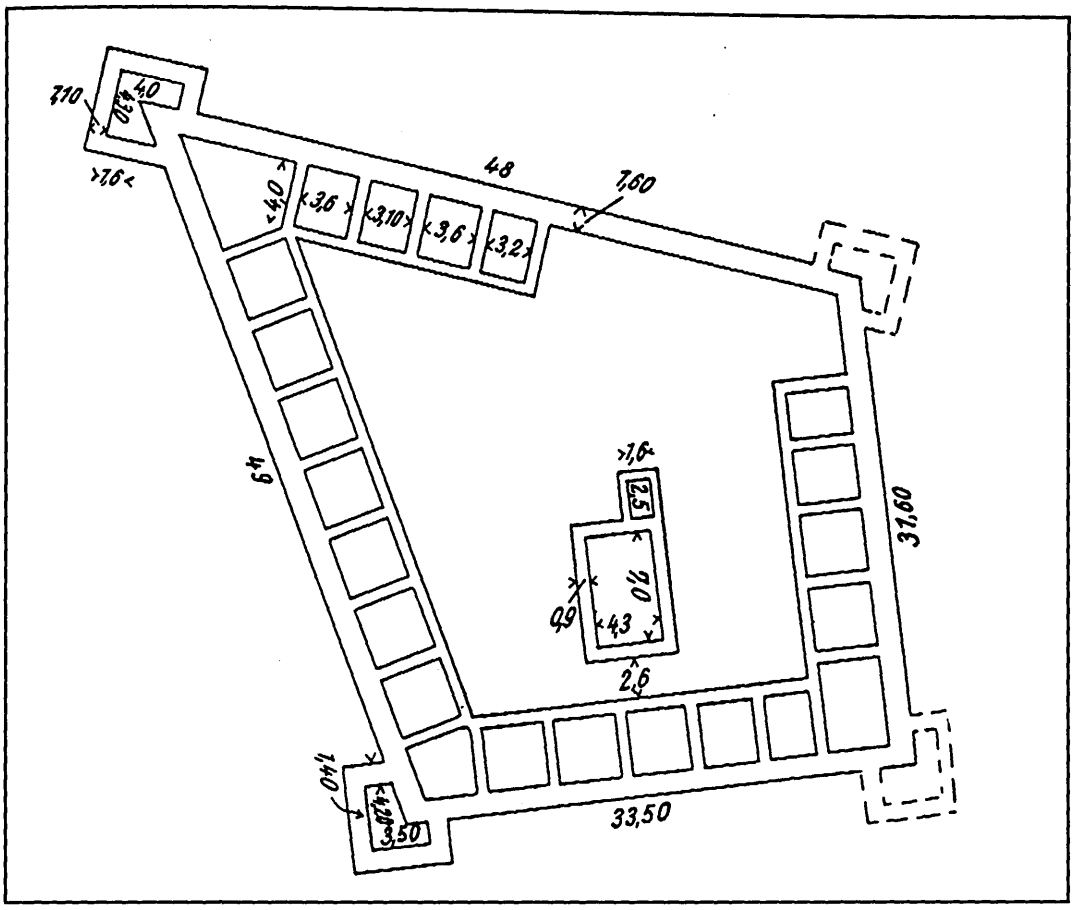



Figure 58 Plan of Khirbat Kithara (scale 1:500). *From Alt 1936 , 104 Abb. 33*

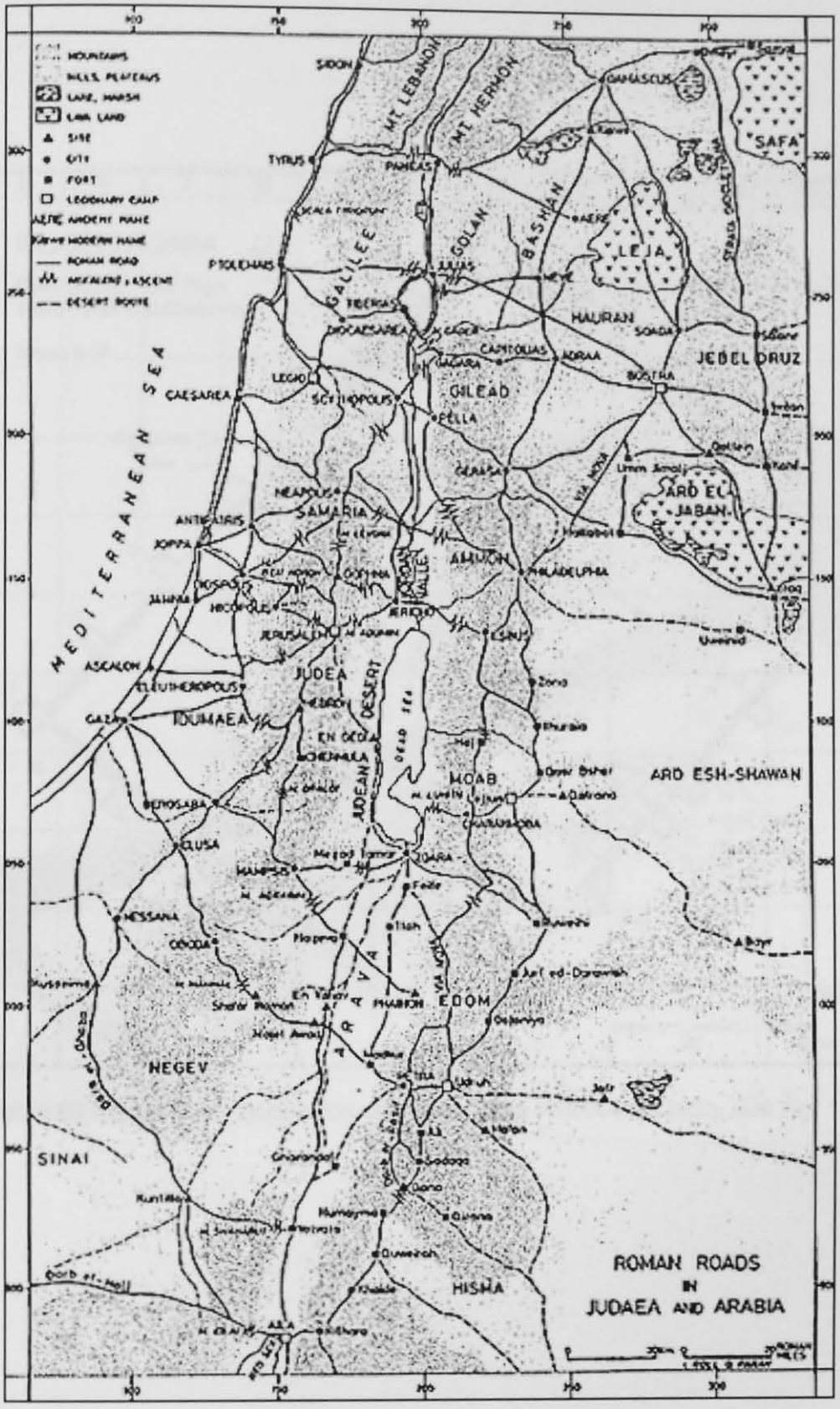



Figure 59 Location of Roman Roads according to Roll. *From Tsafrir et al 1994*

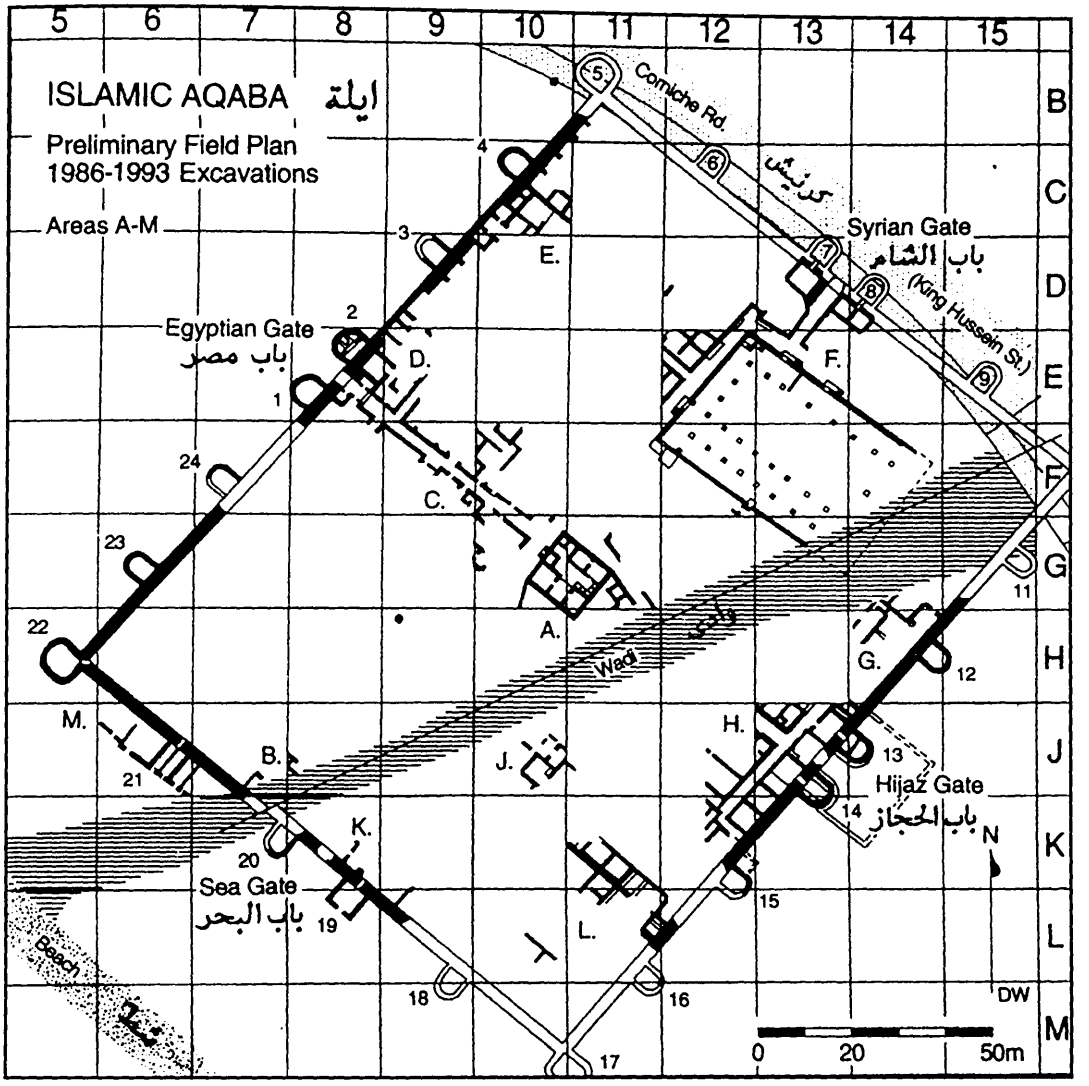



Figure 60 Plan of Early Islamic fort at Aqaba. *From Whitcomb 1995b, 500 Fig. 1*

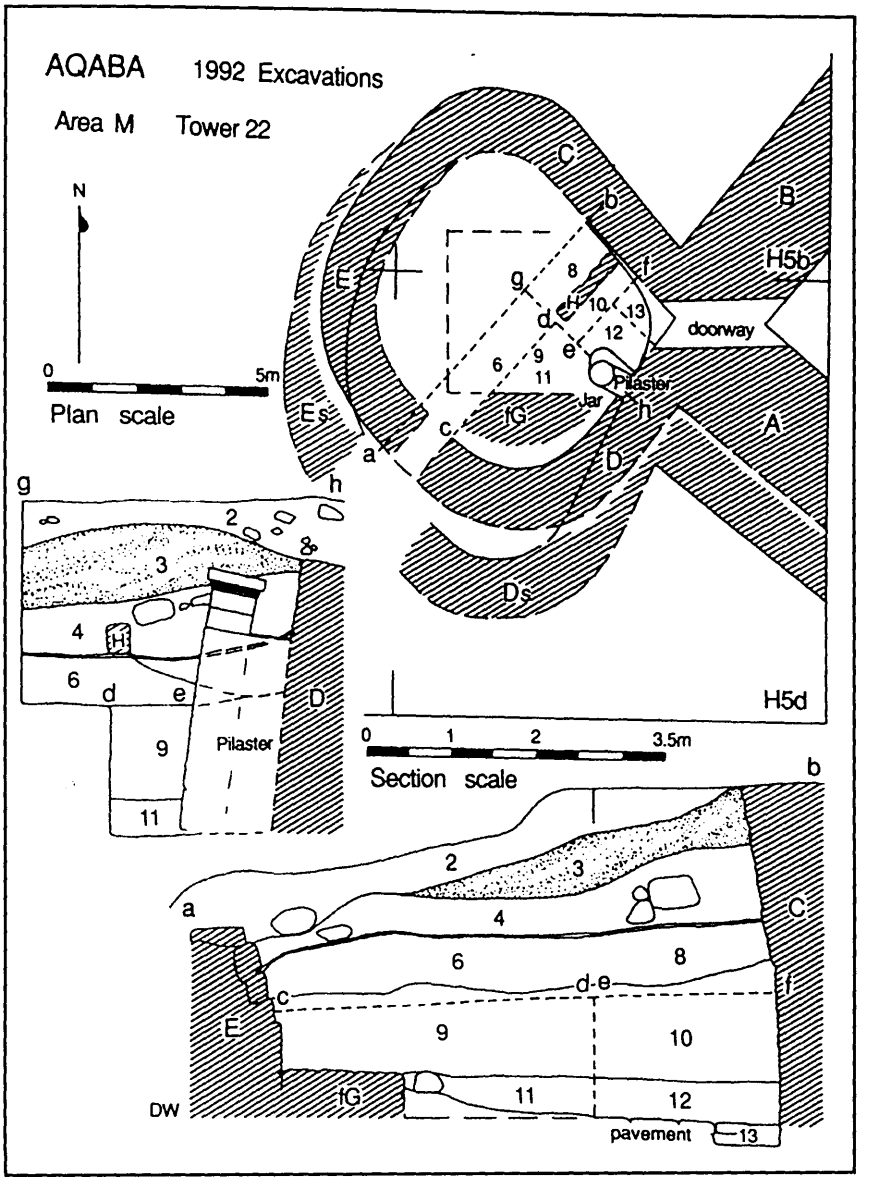



Figure 61 Section of Tower 22. *From Whitcomb 1995b, 504 Fig. 5*

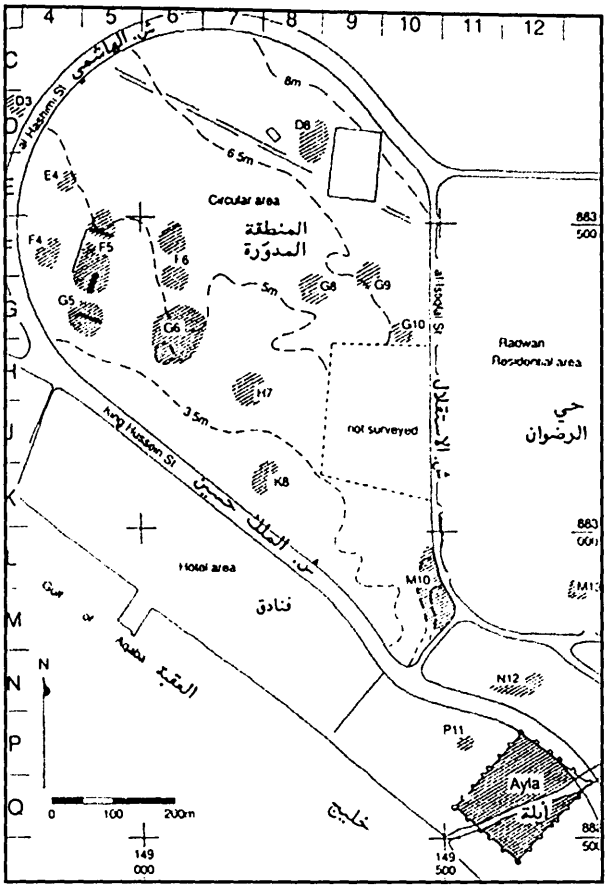



Figure 62 Meloy's survey of Aqaba. *From Meloy 1991, 400 Fig. 1*

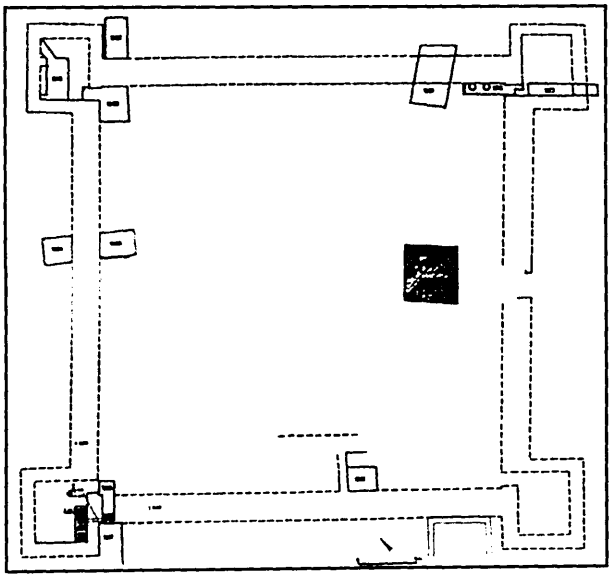


Figure 63 Plan of Yotvata. *From Meshel 1989, 230 Fig. 1*

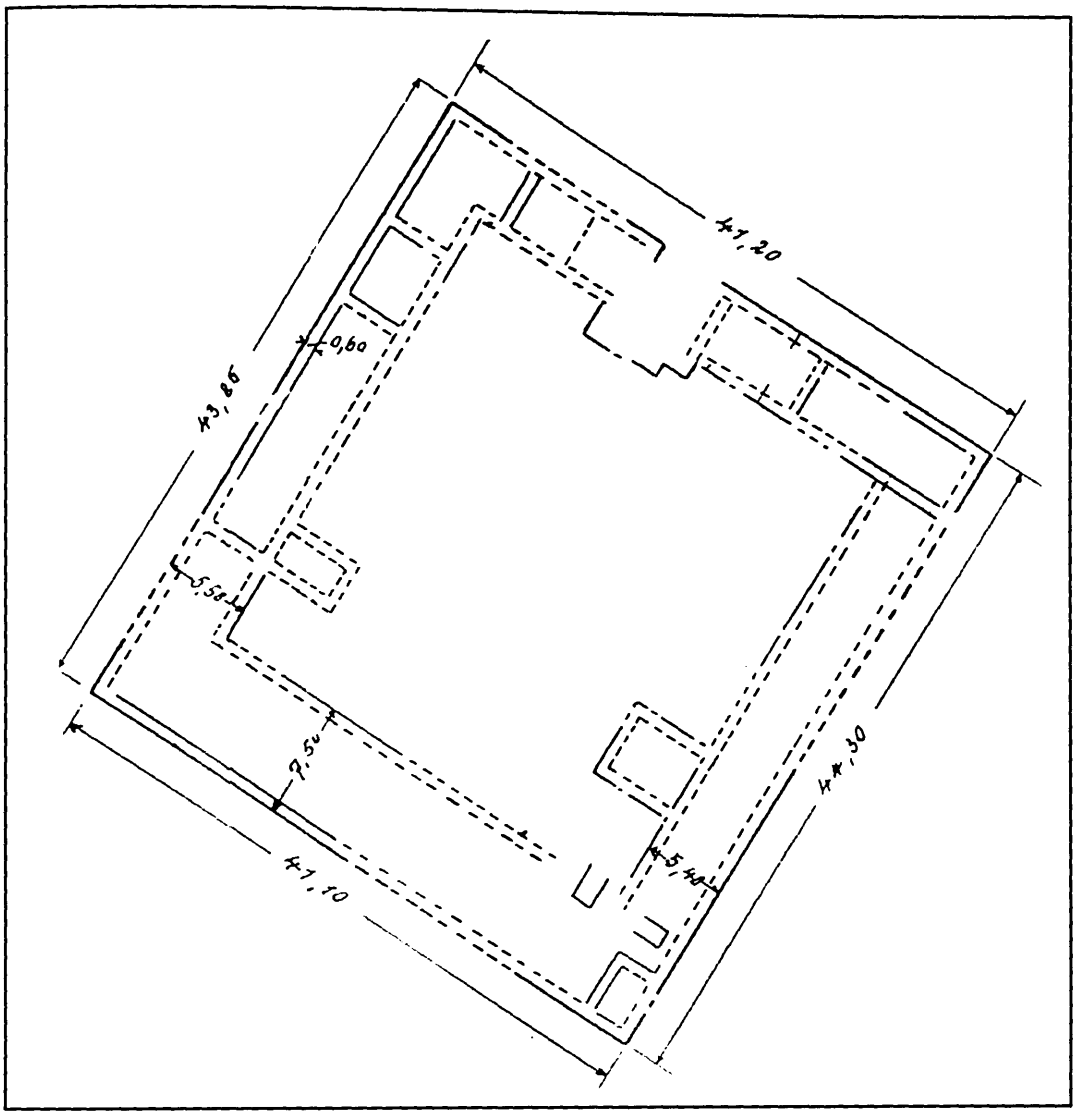



Figure 64 Moa Awad. *From Frank 1934 Plan 30b Scale 1:500*

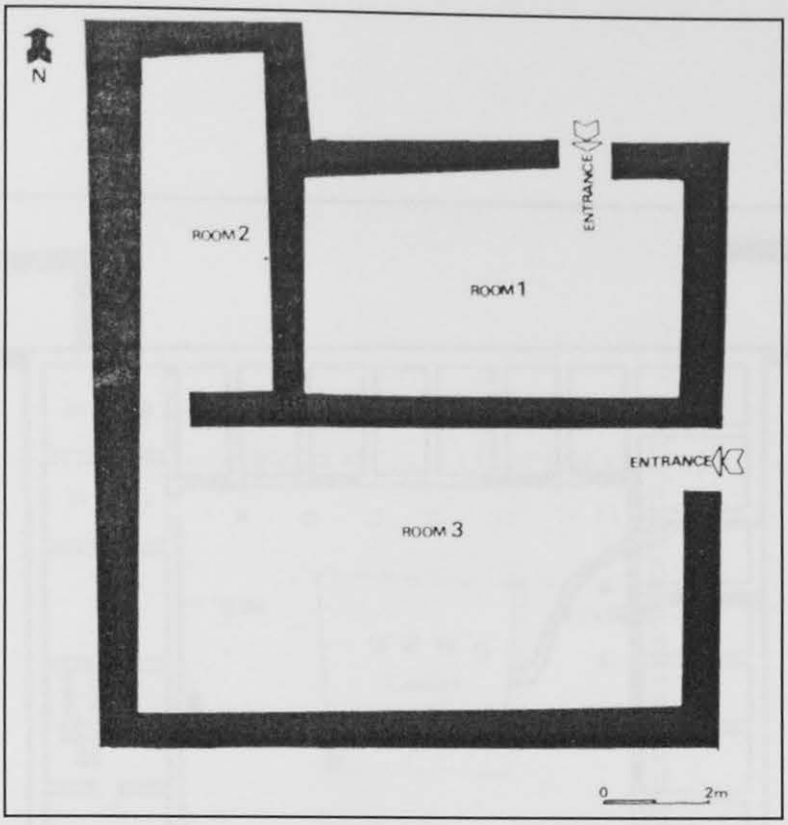



Figure 65 Plan of Ein Yahav. *From Gichon 1980, 849 Fig. 56.3*

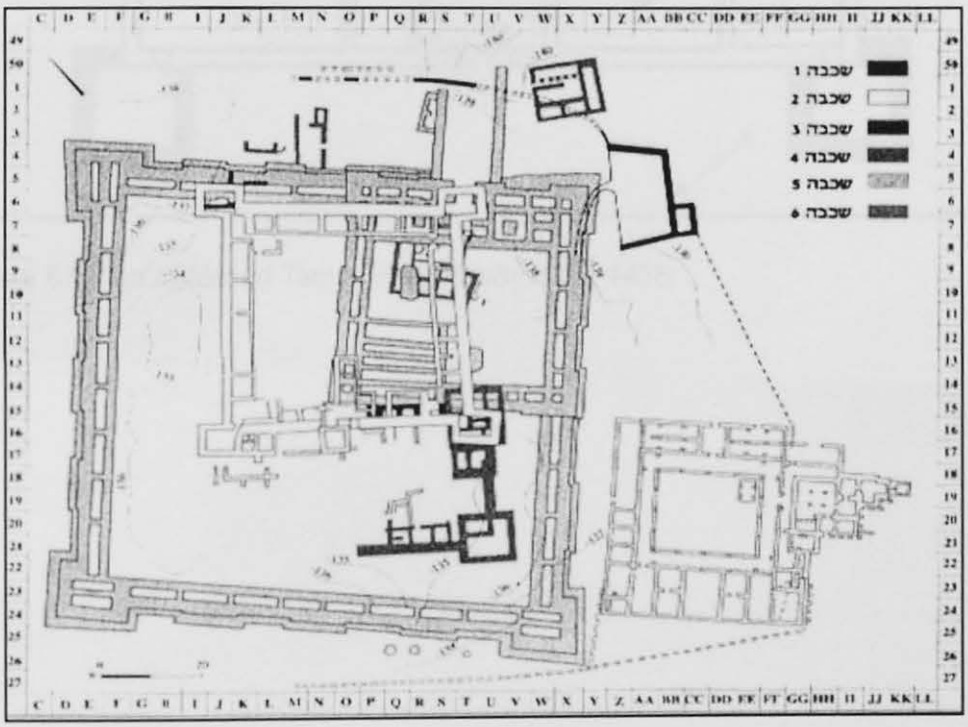


Figure 66 Plan of Ain Hosb. *From http://www.israntique.org.il/text/sites/hazeva.htm*

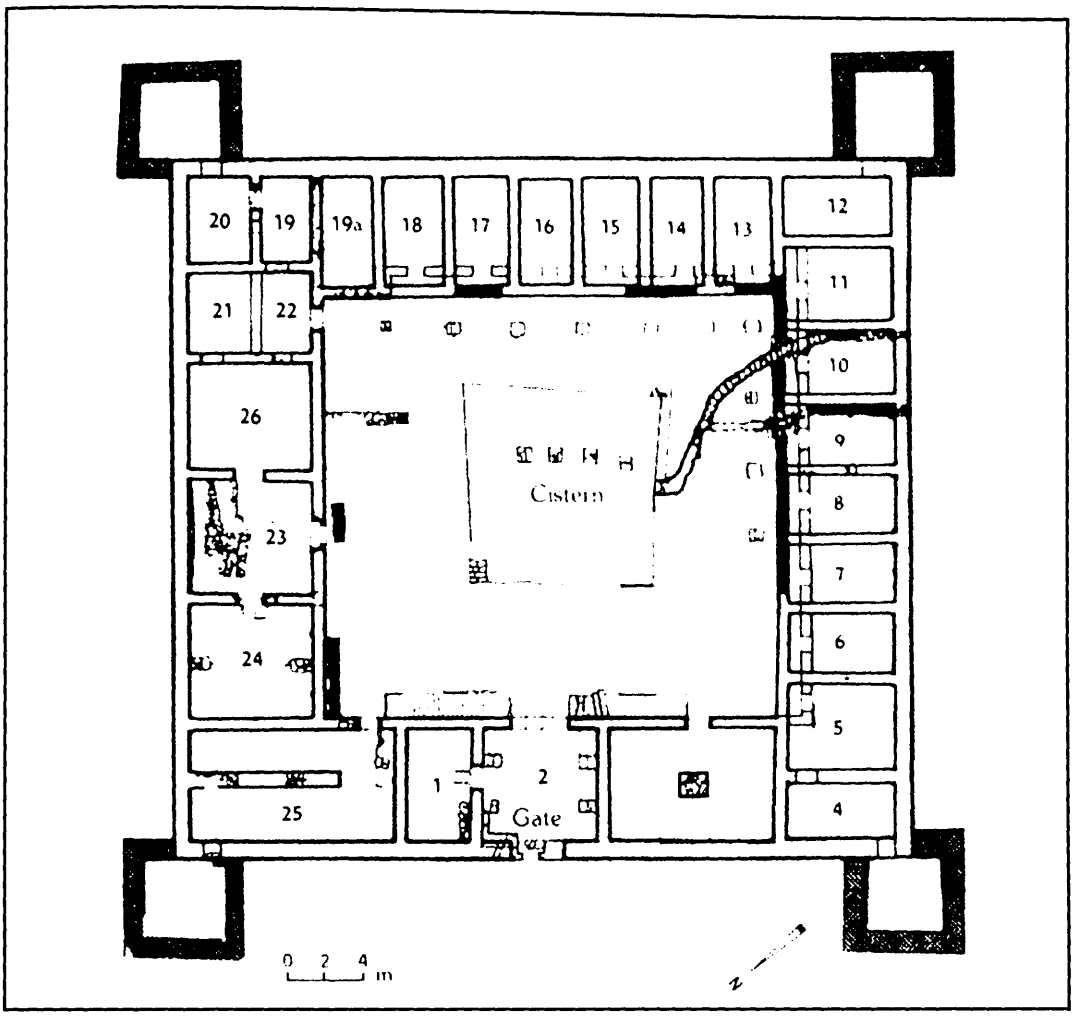



Figure 67 Plan of Mezad Tamar. *From Stern 1993, 1438.*

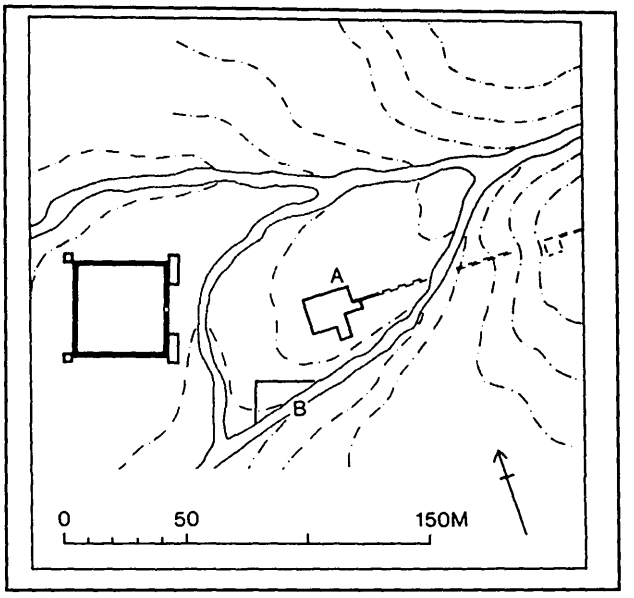



Figure 68 Plan of Khirbat Gharandal. *From Kennedy & Riley 1990, 209 Fig. 161*

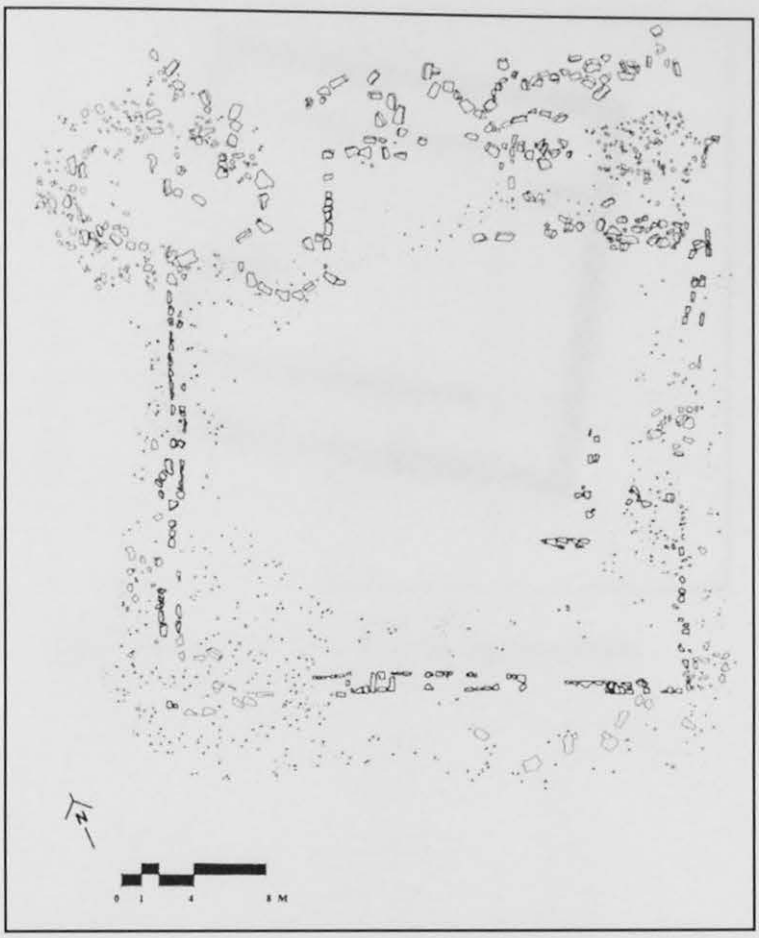


Figure 69 Plan of Qaa' Es Saiyadin. *From Smith et al 1997, 61 Fig. 13*

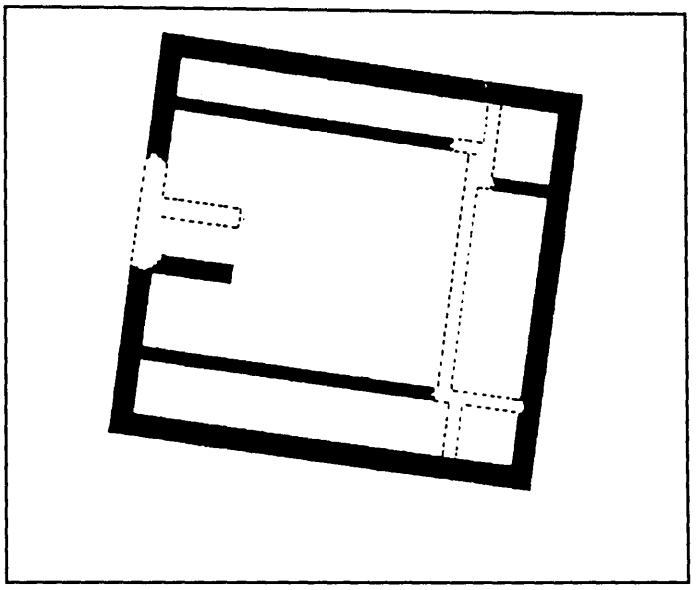


Figure 70 Plan of Qasr Wadi Et Tayyiba (Scale 1:500). *From Frank 1934 Plan 22A*

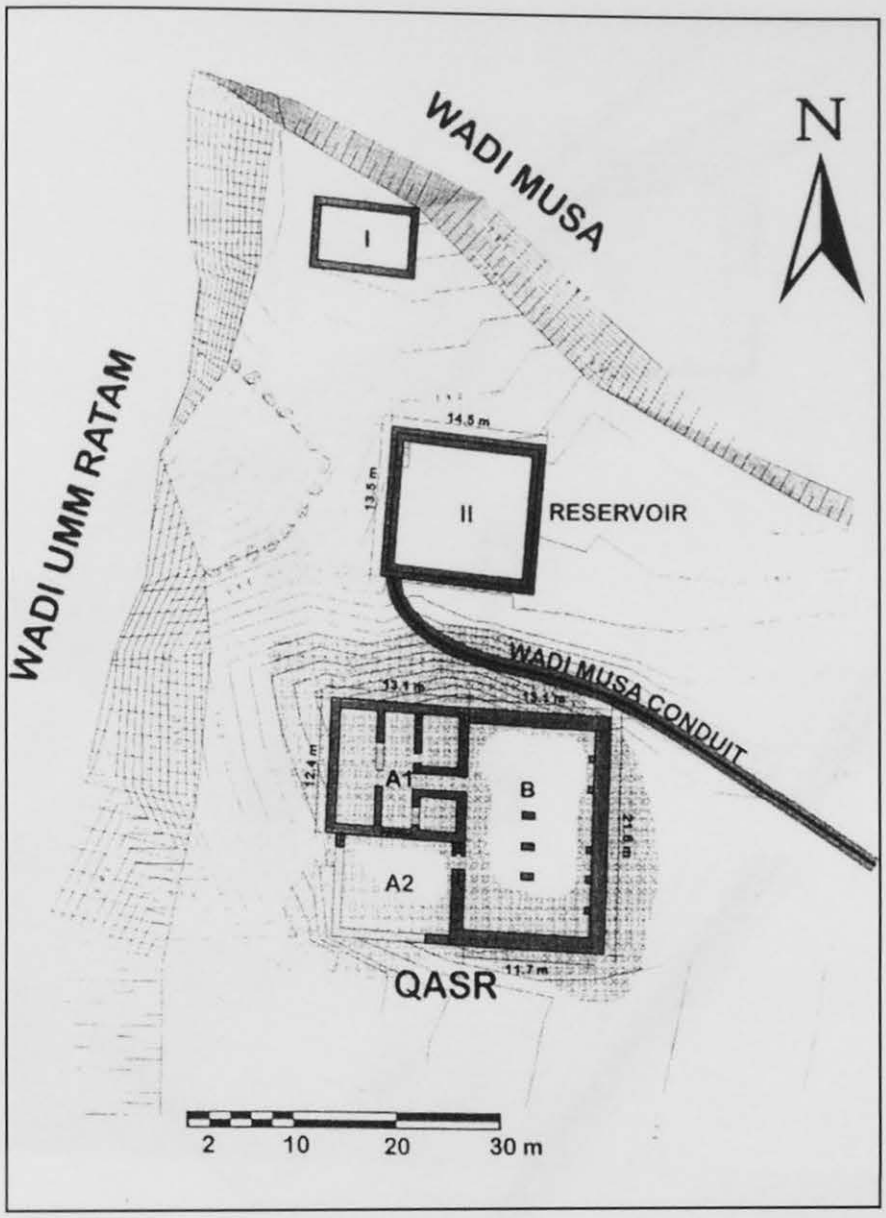



Figure 71 Plan of Qasr Wadi Umm Ar Ratam. *From Lindner et al 2000, 546 Fig. 11*

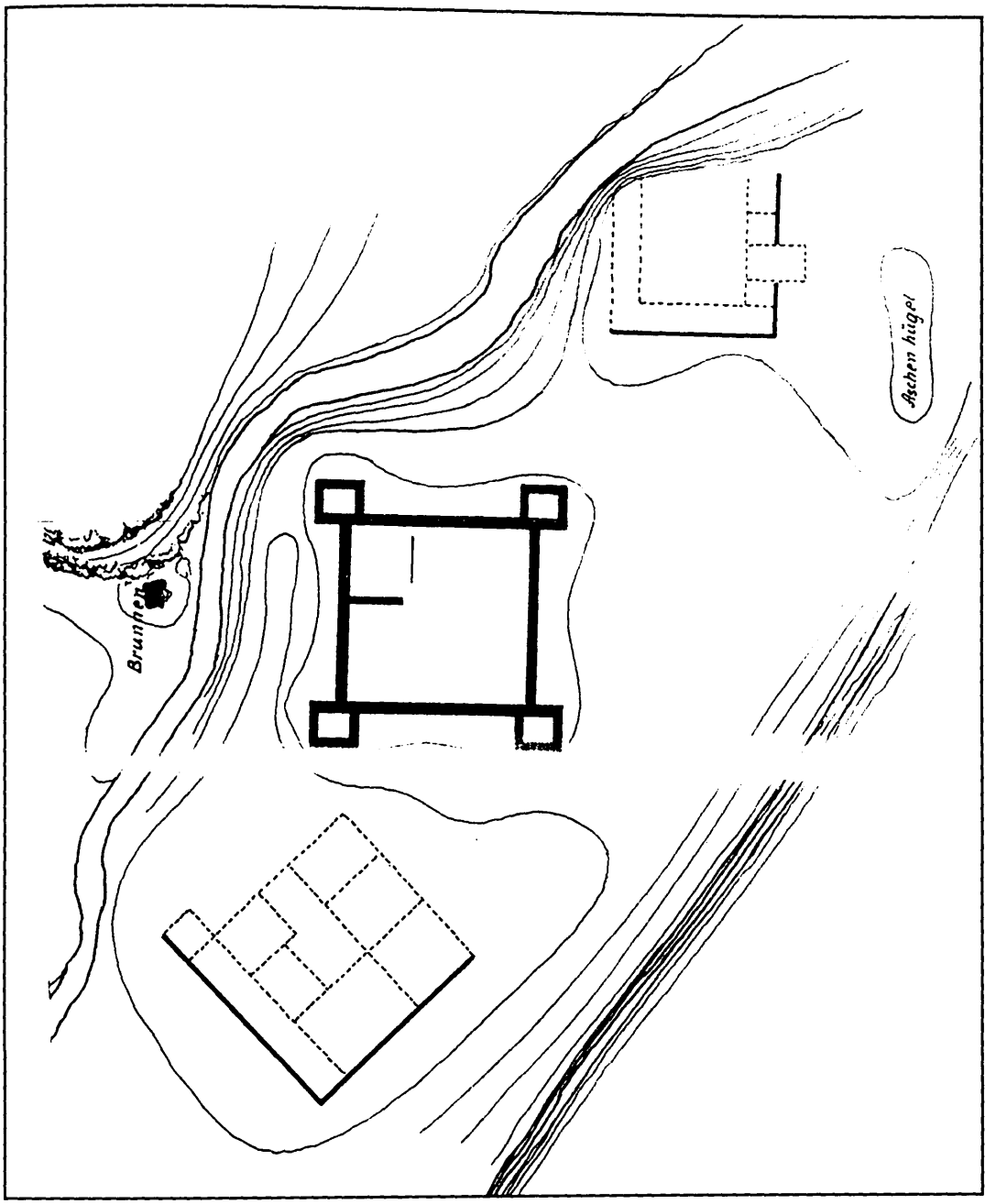



Figure 72 Plan of Bir Madhkur (Scale 1:1000). *From Frank 1934, 24*

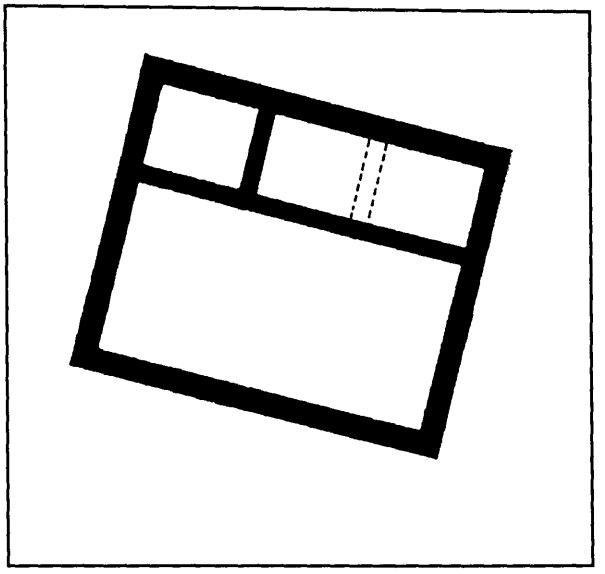


Figure 73 Plan of Qasr Namala (Scale 1:500).
*From Frank 1934 Plan 22b*

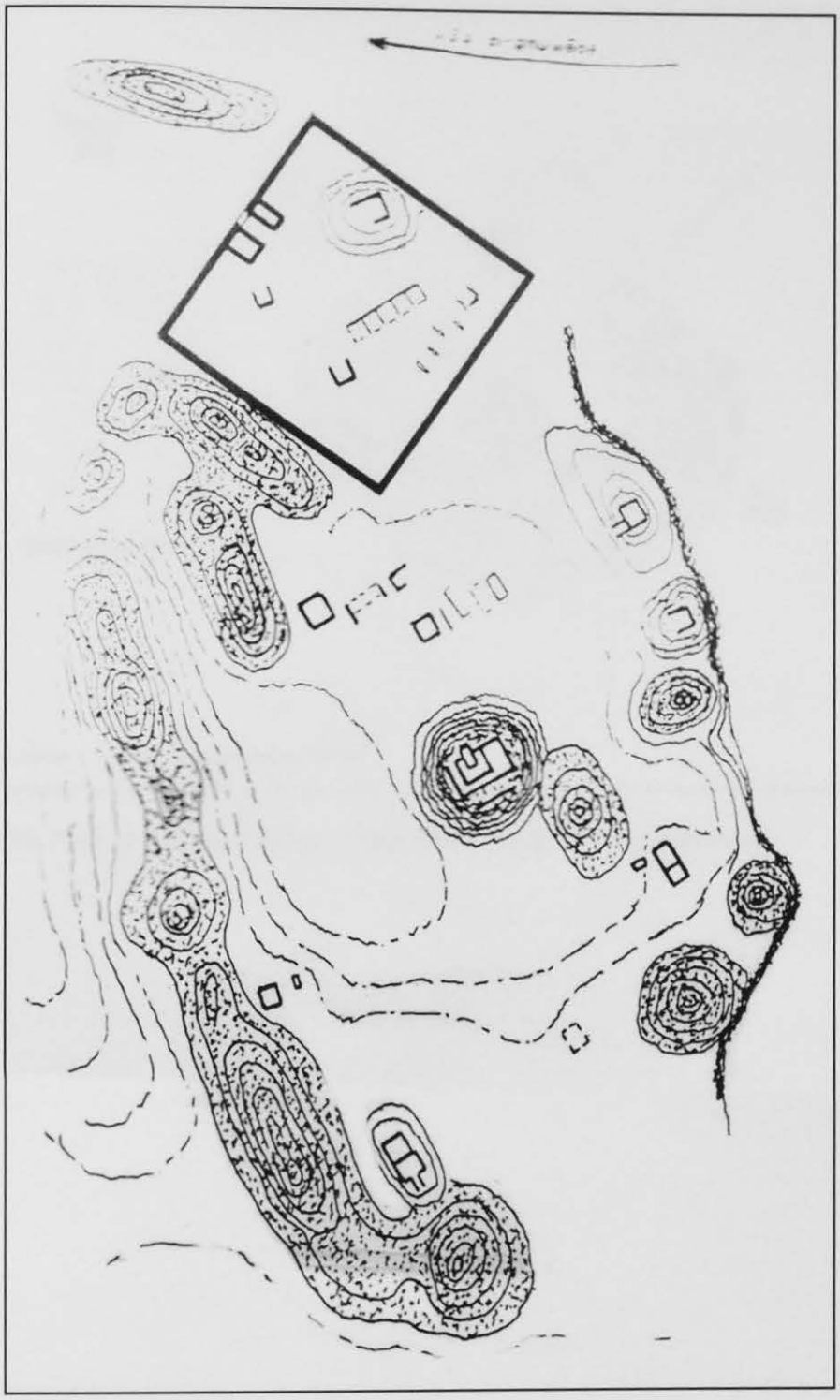


Figure 74 Plan of Khirbat Nahas. *From Frank 1934 Plan 16*


Figure 75 Plan of Khirbat Faynan. *From CBRL Wadi Faynan 3 Archive*

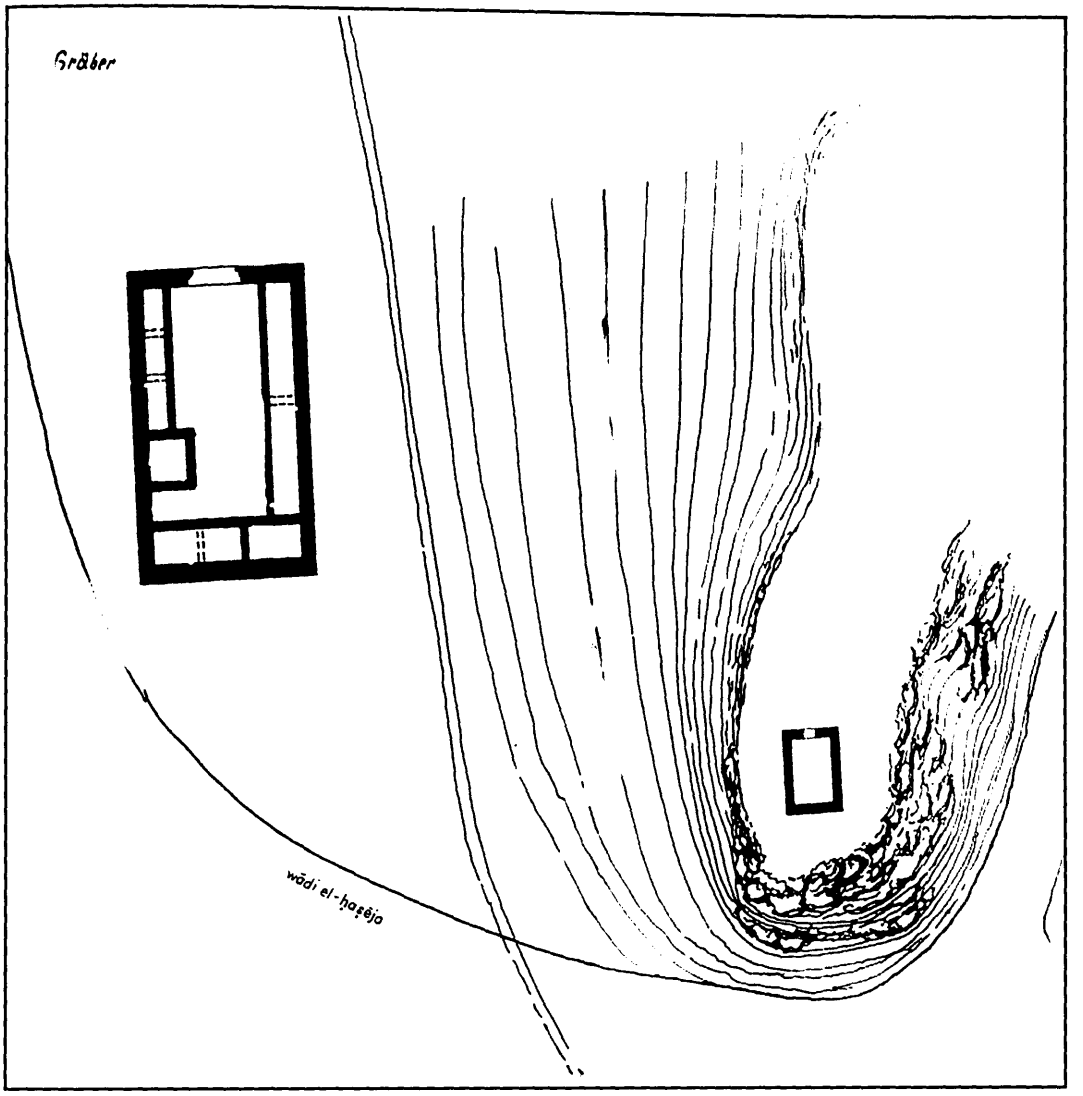



Figure 76 Plan of Khirbat Hassiya. *From Frank 1934 Plan 14*

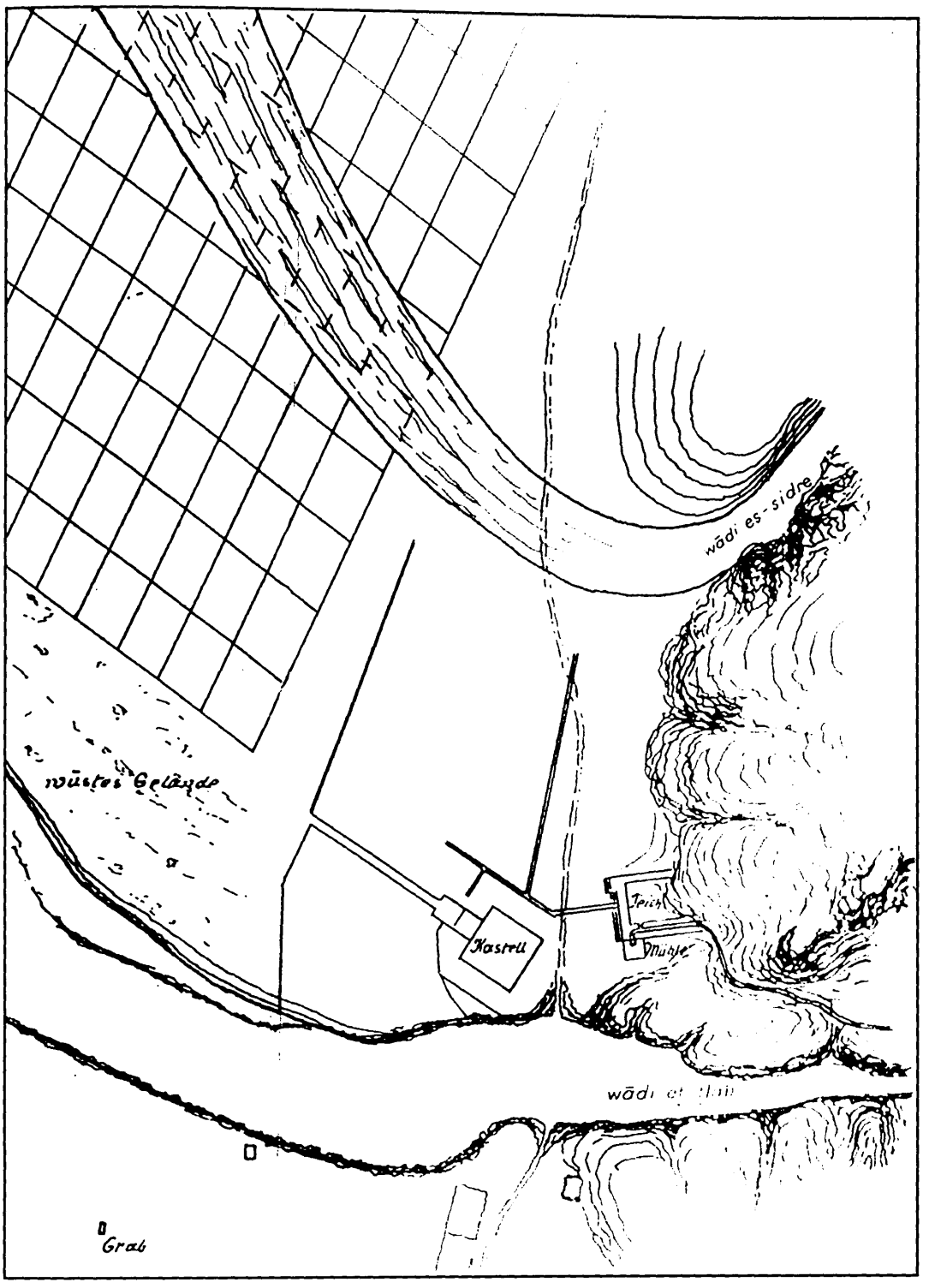



Figure 77 Plan of Qasr Tlah and field system. *From Frank 1934 Plan 13*

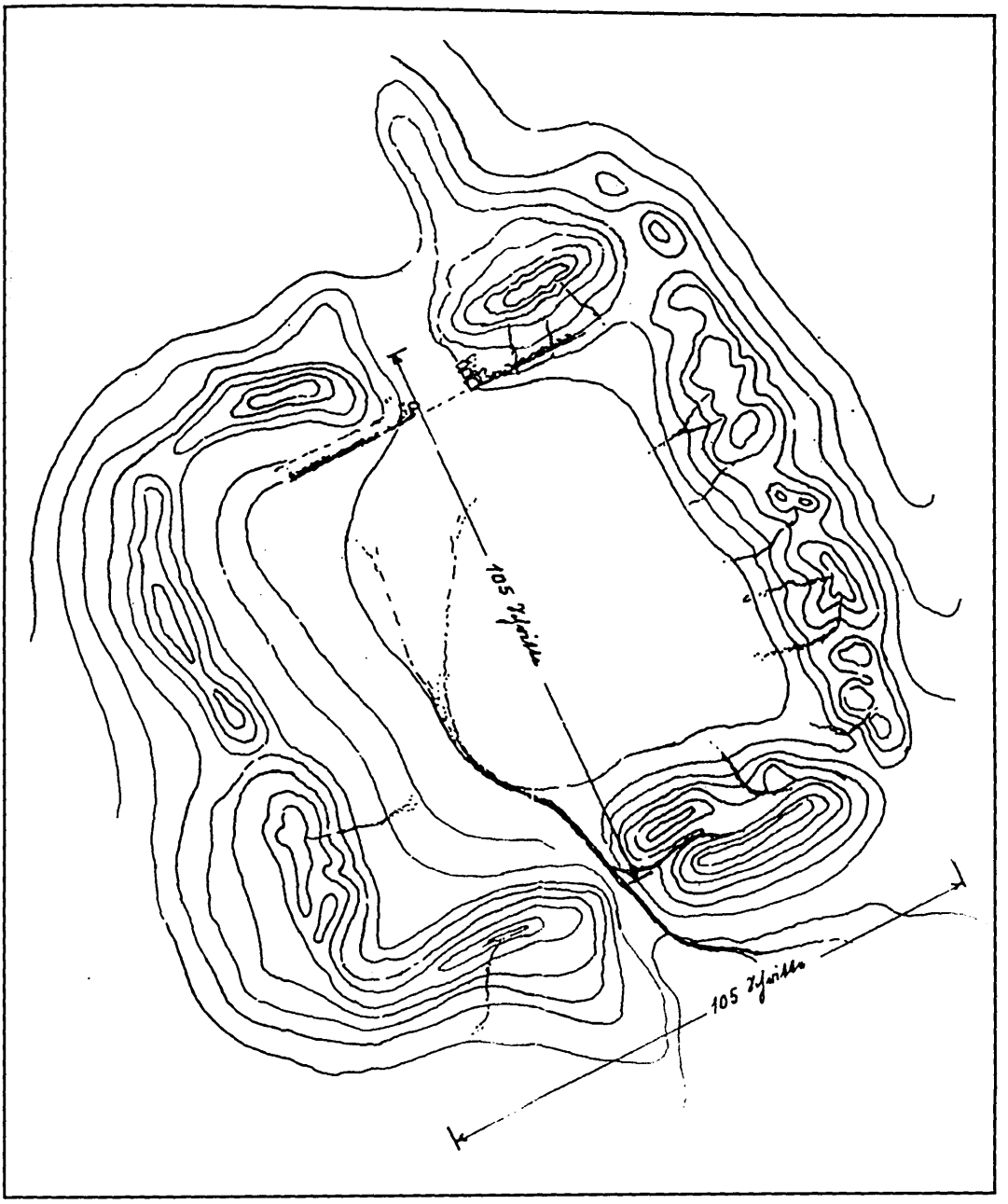



Figure 78 Plan of Qasr Fayfa I. *From Frank 1934 Plan 11*

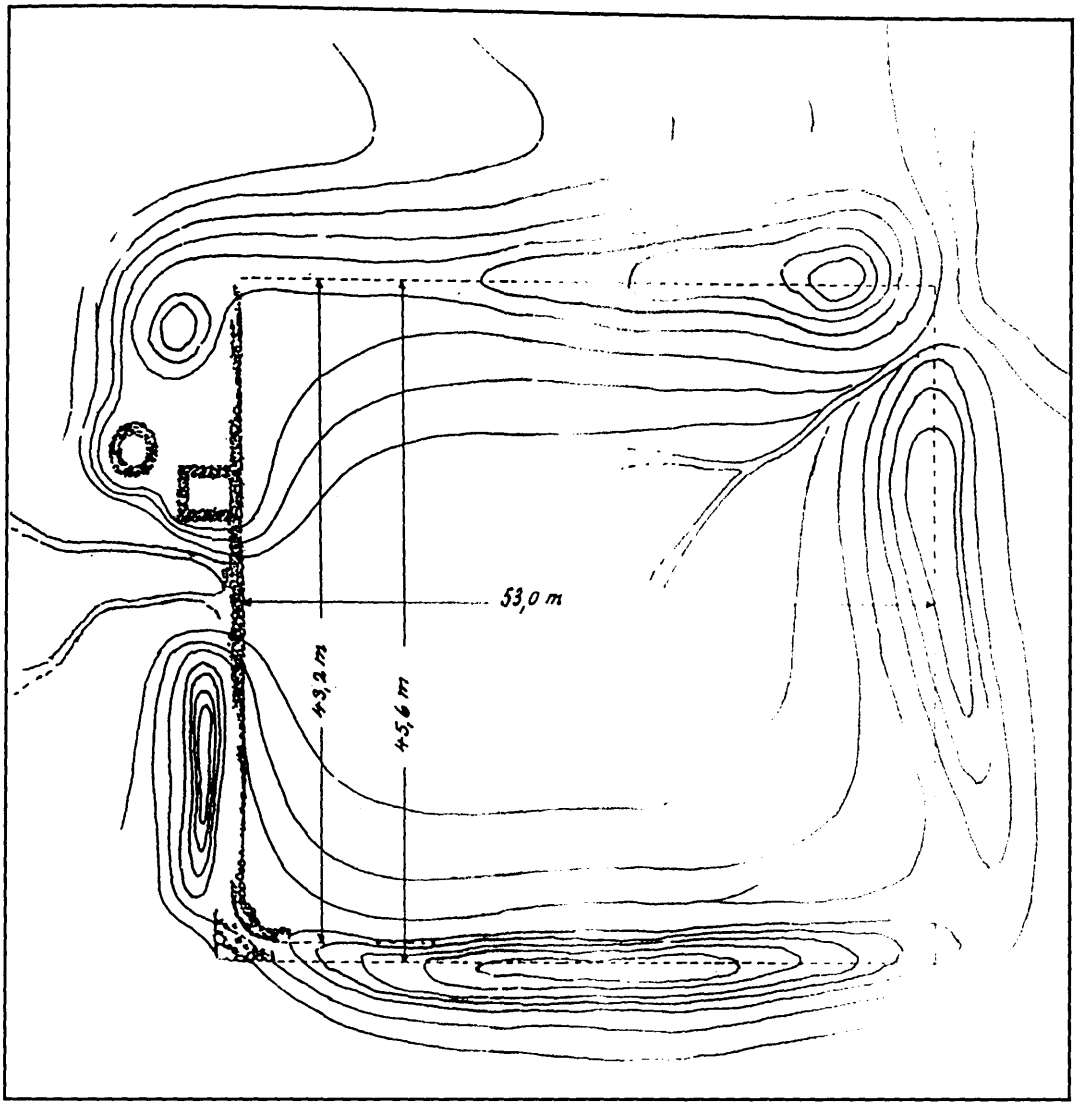



Figure 79 Plan of Qasr Fayfa II. *From Frank 1934 Plan 12*

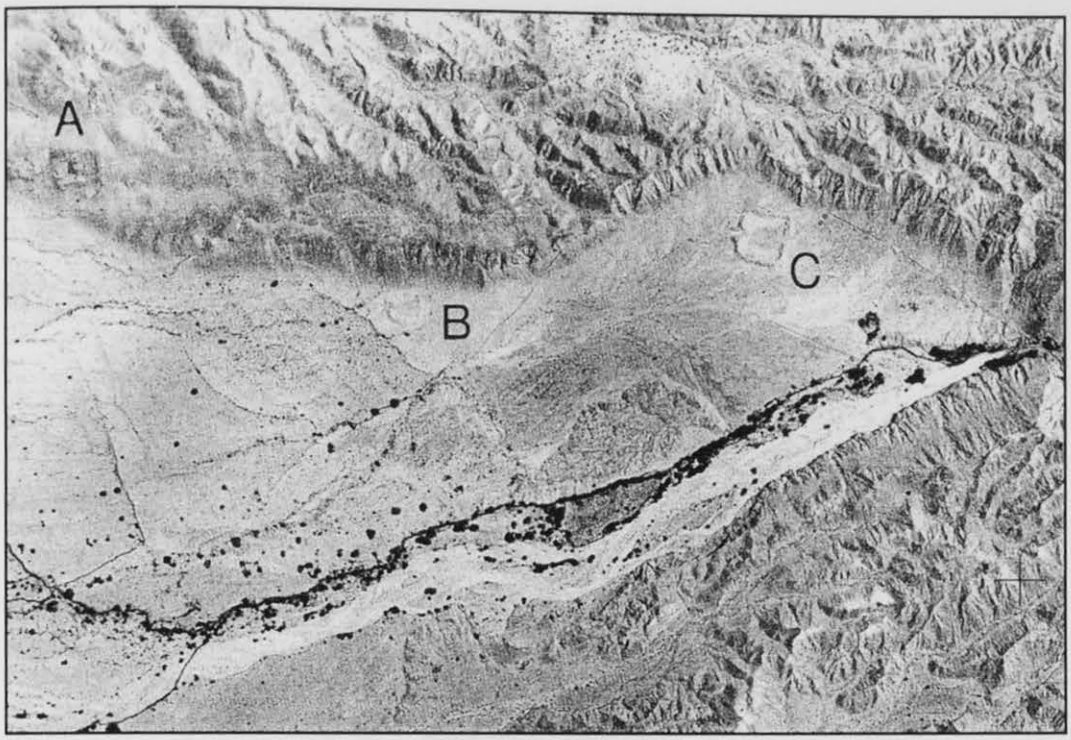



Figure 80 Photo of Wadi Fayfa showing Qasr Fayfa I & II sites. *From Kennedy 2000, 294 Fig. 20.12*


Figure 81 Plan of Khirbat Labroush. *From Kitchener 1884, between 216-217*

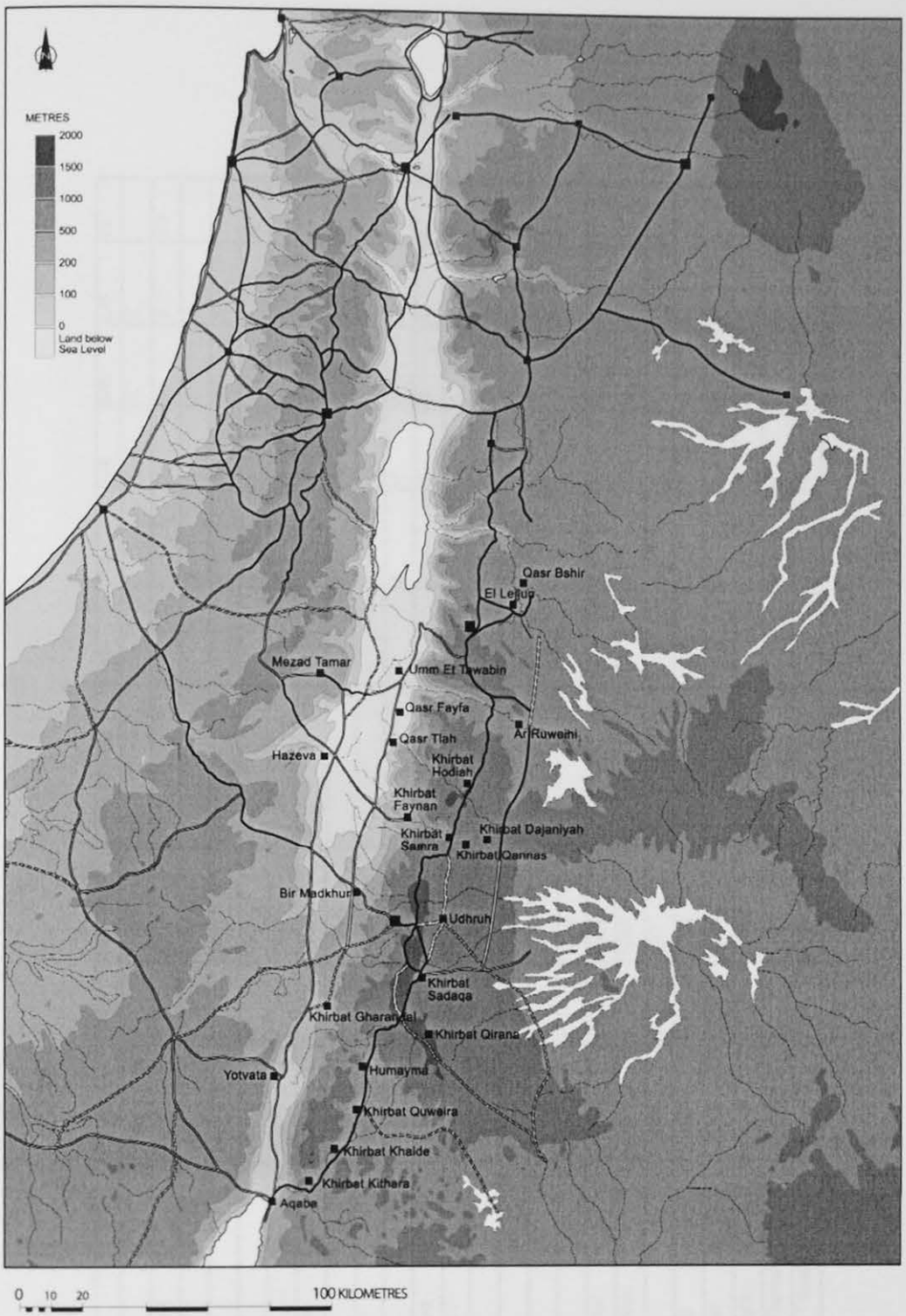



Figure 82 Revised map of military sites in southern Jordan and Wadi Arabah.

| Site | Location | Tower | Size (m2) | Caravanserai | Nab | ER | LR | EB | LB | EI |
|---|---|---|---|---|---|---|---|---|---|---|
| Lejjun | Kerak | Y | 47000 | Y? | | | X | X | X | |
| Qasr Bshir | Kerak | Y | 3078 | N | X | | X | X | X | X? |
| Ruweihi | Hasa | Y | 5208 | Y | X | X | X | X | X | |
| Hodiah | Jibal | Y | 2400 | Y? | X | X | X | X | X | |
| Samra | Jibal | N | 4900 | N | X | X | | | X | X |
| Qannas | Jibal | Y | 2380 | Y | X | X | X | X | X | X |
| Dajaniyah | Jibal | Y | 10000 | N | | | X | X | X | |
| Udhruh | Sheraa | Y | 47000 | ? | X? | X? | X | X | X | X |
| Sadaqa | Sheraa | Y | 9600 | ? | | | | | | |
| Qirana | Sheraa | Y | 3150 | ? | X | X | X | X | X | |
| Humamya | Hisma | Y | 30597 | Y | X | X | X | X | X | X |
| Quweira | Hisma | Y | 1024 | N | X | X | X | X | | |
| Khalde | Hisma | Y | 1584 | Y | X | X | X | X | X | |
| Kithara | Hisma | Y | 1200 | N | X | X | X | X | X | |
| Aqaba | Arabah | Y | 21745.5 | ? | X | X | X | X | X | X |
| Yotvata | Arabah | Y | 1564 | ? | | | X | X | | |
| Gharandal | Arabah | Y | 1369 | ? | X | X | X | X | X | |
| Bir Madhkur | Arabah | Y | 1088 | Y | X | X | X | X | X | |
| Faynan | Arabah | N | 900 | N | X | X | X | X | X | |
| Ain Hosb | Arabah | Y | 2116 | ? | X | X | X | X | X | |
| Qasr Tlah | Arabah | Y | 1600 | ? | X | X | X | X | X | X |
| Qasr Fayfa | Arabah | ? | 10000 | Y? | | | | | | |
| Mezad Thamar | Arabah | Y | 1444 | N | X | X | X | X | X | X |
| Umm et Tawabin | Arabah | ? | 30000 | | X | X | X | X | X | X |

Table 14 Revised table of military sites in southern Jordan and Wadi Arabah

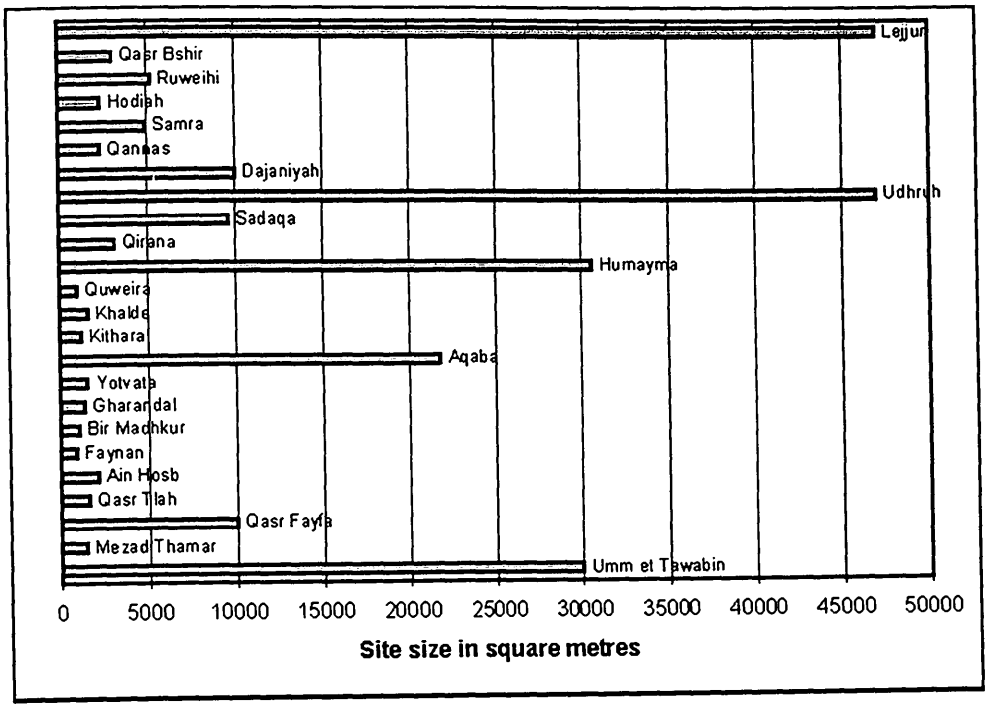



Figure 83 Graph of military site sizes in southern Jordan and Wadi Arabah.

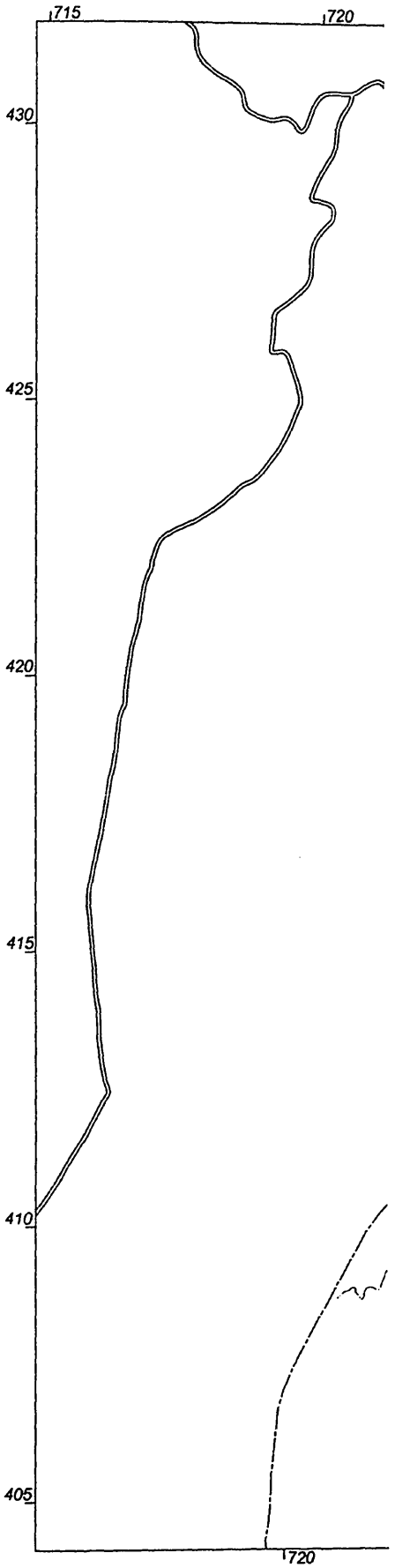



Figure 84
DAS Map I

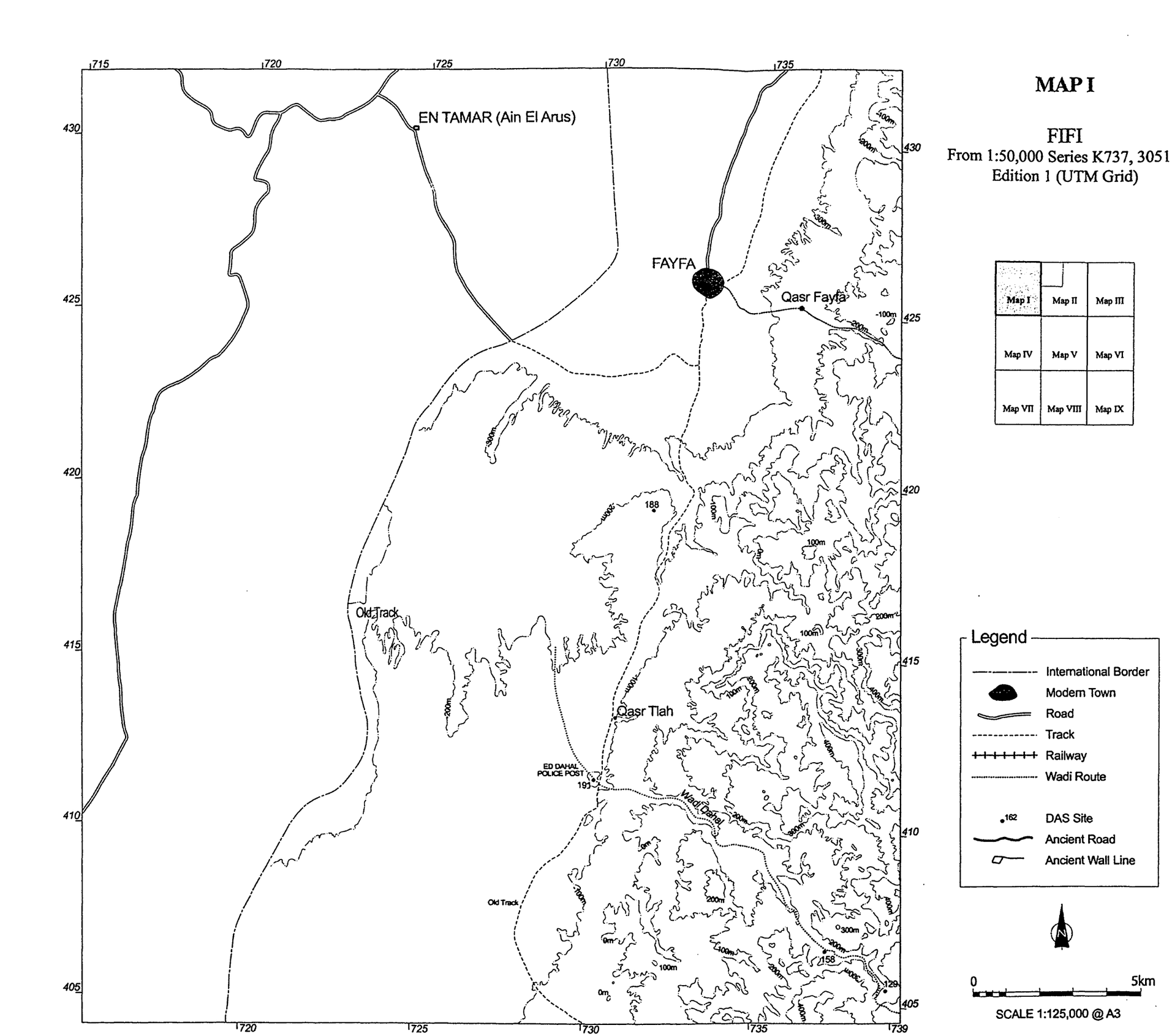


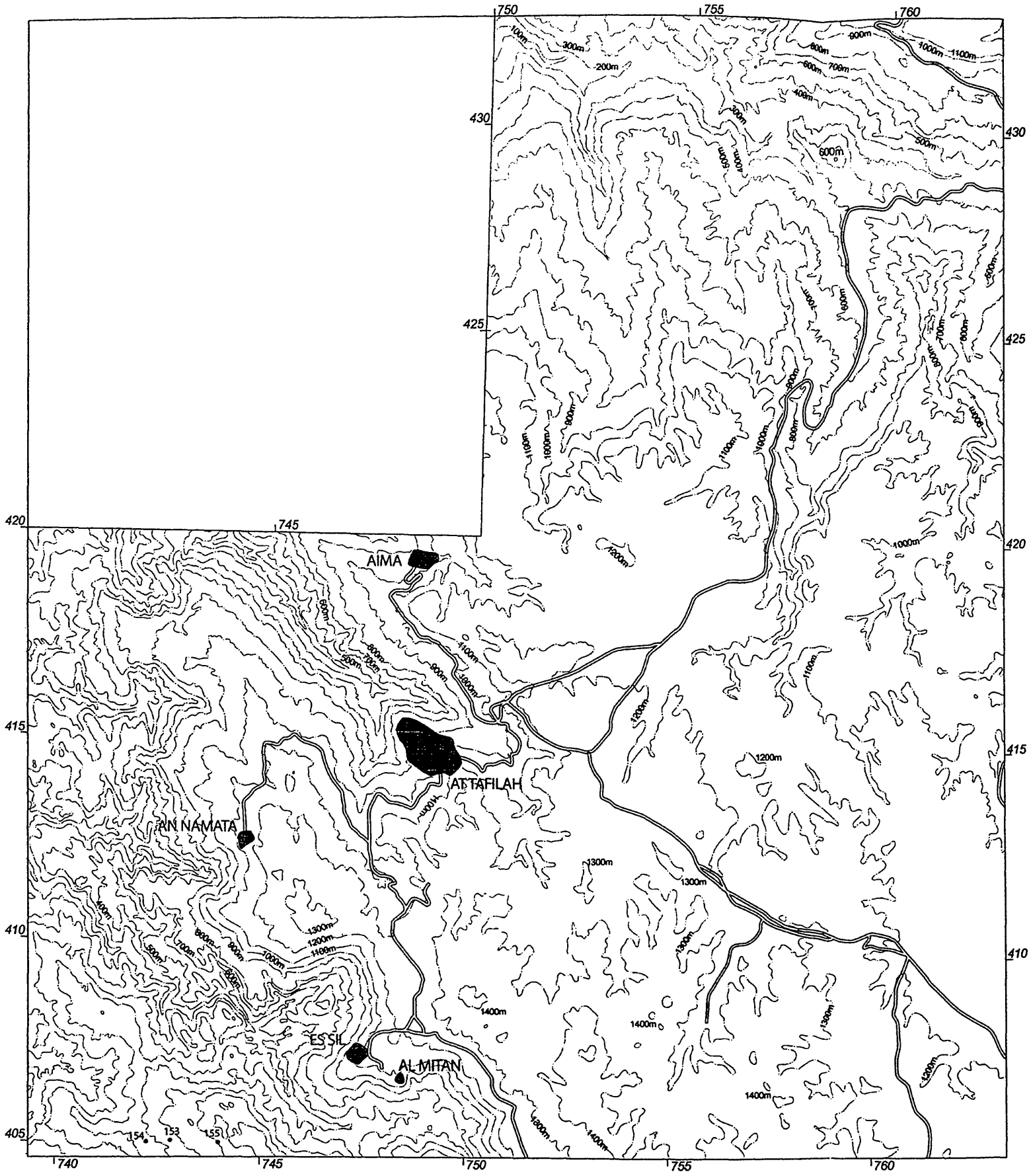

Figure 84
DAS Map I

# MAP II

## AT TAFILA

From 1:50,000 Series K737, 3151 IV.
Provisional Printing (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |




Legend

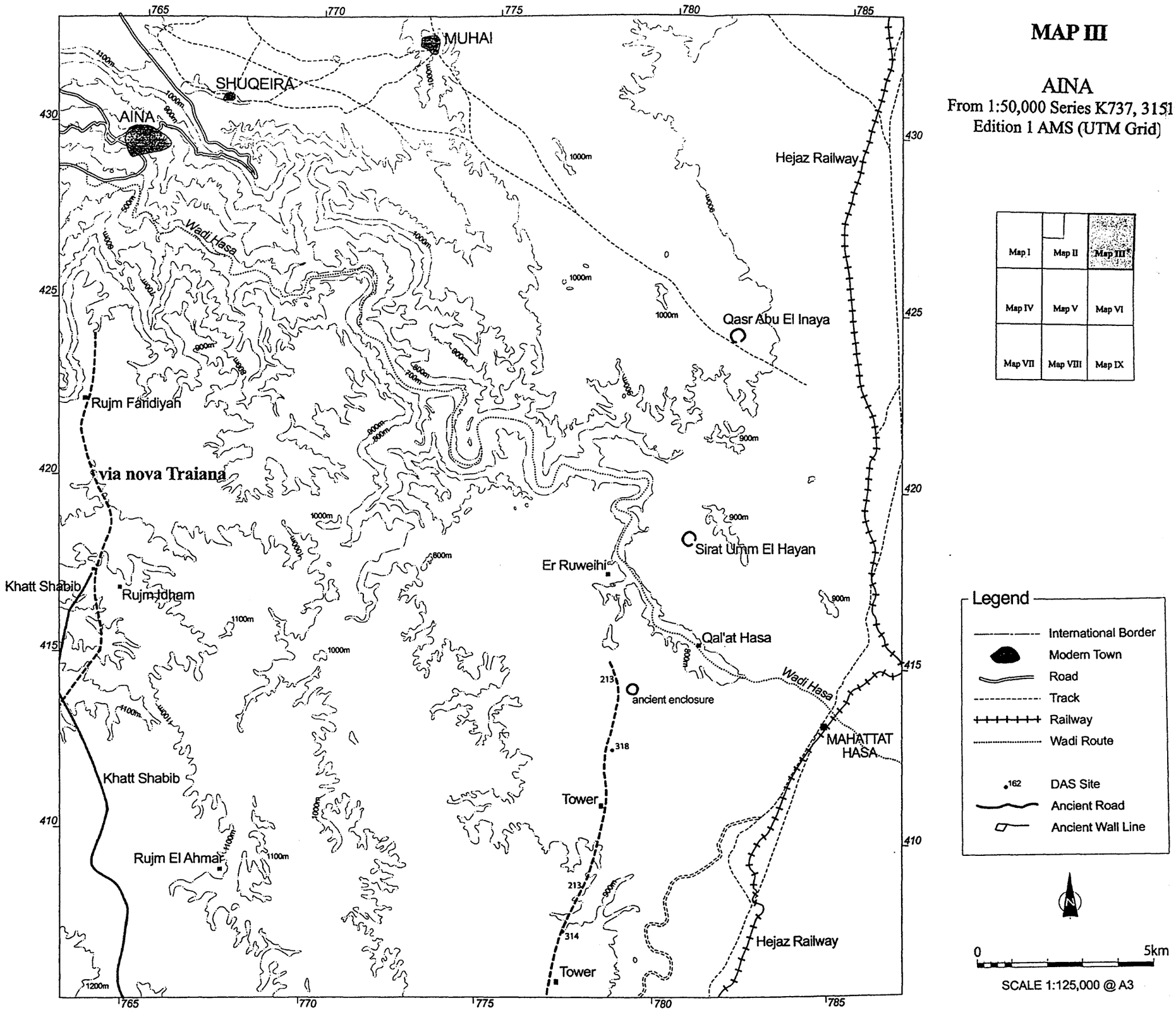
- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

N

0 5km

SCALE 1:125,000 @ A3

Figure 85
DAS Map II




# MAP III

## AINA

From 1:50,000 Series K737, 3151 I.
Edition 1 AMS (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |

**Legend**

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

0 5km

SCALE 1:125,000 @ A3

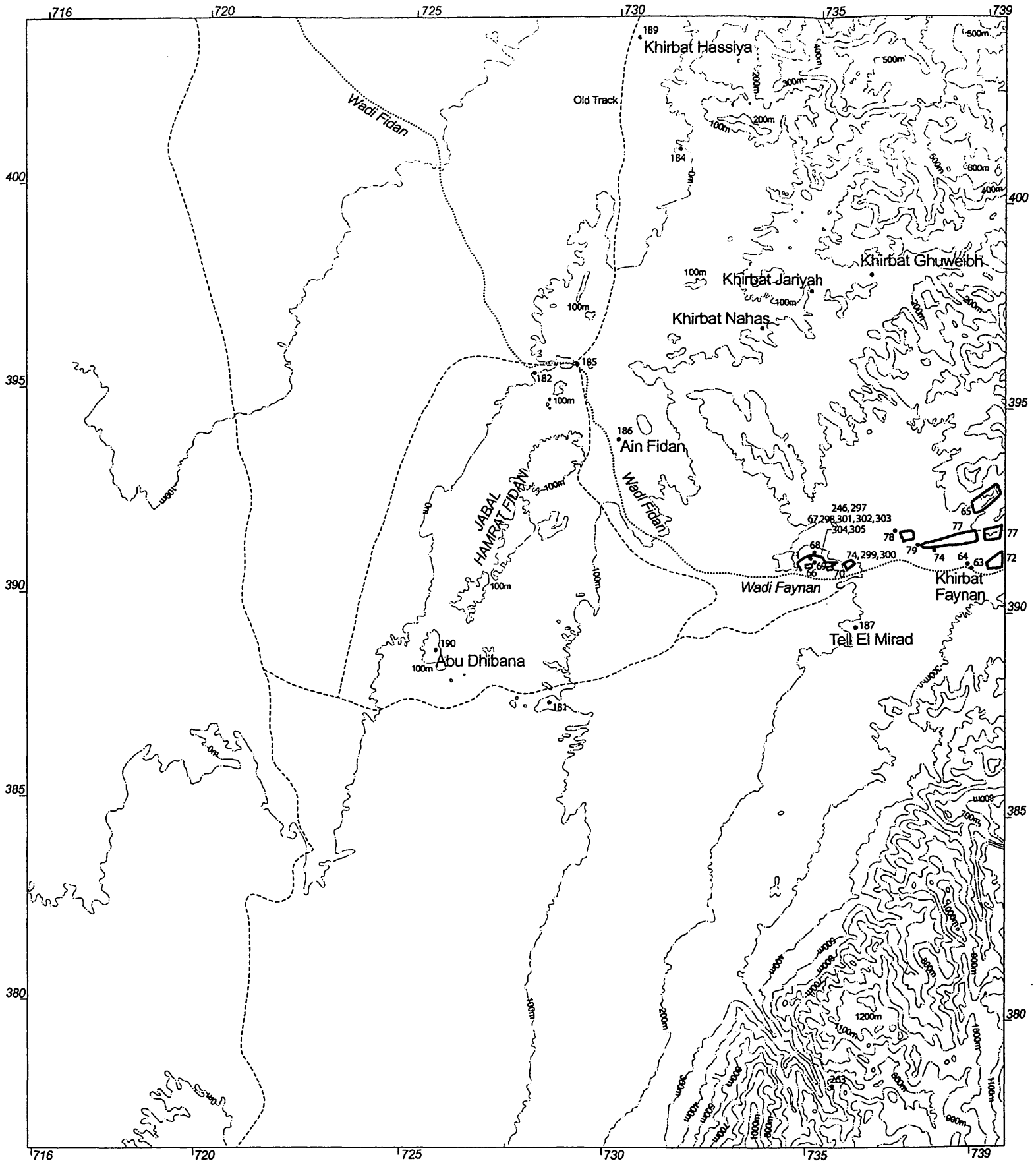
Figure 86
DAS Map III

# MAP IV

## JEBEL HAMRAT FIDAN

From 1:50,000 Series K737, 3051 II.
Provisional Printing (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |




Legend

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

N

0 5km

SCALE 1:125,000 @ A3

Figure 87
DAS Map IV

# MAP V

## SHAUBAK

From 1:50,000 Series K737, 3151 III.
Edition 1 Topocom (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |

BUSEIRAH
Et Tuwaneh
GHARANDAL
RASHIDIYAH POLICE POST
Jabal Sarab
Jabal Rummana
DANA
Jabal Ataita
Khatt Shabib 198, 219 & 220
Wadi Dana
Barra
QADISIYAH
Wadi Ghuweir
Hudeira
Khirbat Samra
Beda
via nova Traiana
El Fjeij
Jabal Dejaniyah
Khatt Shabib 198, 219 & 220
MUQARIYAH
SIHAN
ABU MAKHTUB
SHAUBAK CASTLE
NIJIL POLICE POST
NIJIL
Khirbat Qannas 193, 194, 195 & 196
Khirbat Ed Doshaq
via nova Traiana
OTTOMAN RAILWAY (now destroyed by modern road)

Legend

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- DAS Site
- Ancient Road
- Ancient Wall Line

0 5km

SCALE 1:125,000 @ A3

Figure 88
DAS Map V

# MAP VI

## JURF ED DARWISH

From 1:50,000 Series K737, 3151 IV
Edition 1 AMS (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |

765 770 775 780 785

405 400 395 390 385 380

Tower
315
213
316
313
317
Hejaz Railway
JURF ED DARWISH
235
213
319
236
Qasr El Bint
1300m
231
Jabal Qirana
Khatt Shabib
198, 219, 220
230
Rujm Bahash
238
Tell El Juheira
390
216
214
215
212
213
211
234
Tell Burma
Line of desert road
213
218
Tell Abu Hitana
217
200
Khirbat Dajaniyah
Track to Jafr
Hejaz Railway
213

Legend

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

N

0 5km

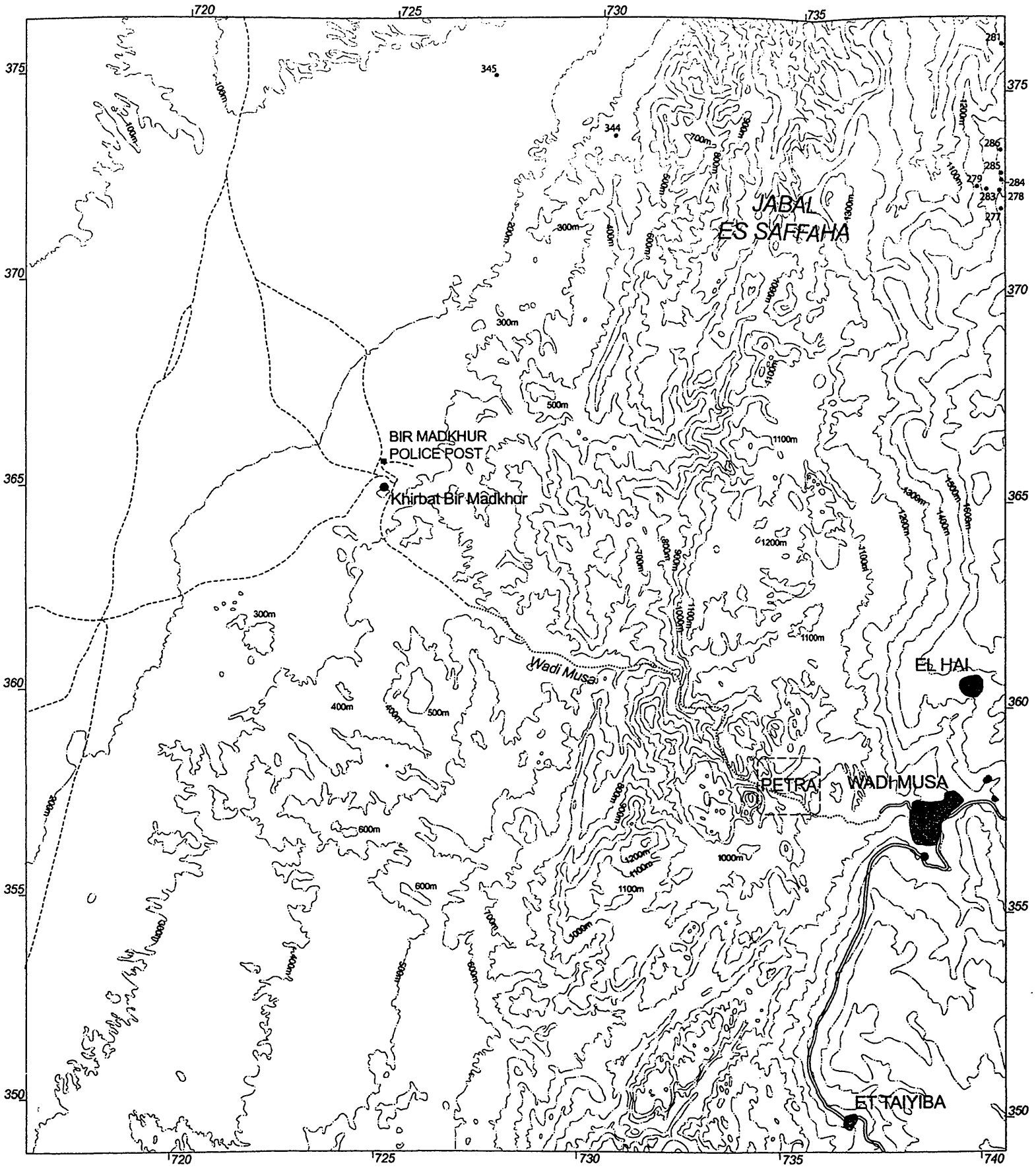
SCALE 1:125,000 @ A3

Figure 89
DAS Map VI

# MAP VII

PETRA
From 1:50,000 Series K737, 3050 I.
Provisional Printing (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |




Legend

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

N

0 5km

SCALE 1:125,000 @ A3

Figure 90
DAS Map VII

# MAP VIII

## BIR KHIDAD

From 1:50,000 Series K737, 3150 I
Edition 1 AMS (UTM Grid)

| | | |
|---|---|---|
| Map I | Map II | Map III |
| Map IV | Map V | Map VI |
| Map VII | Map VIII | Map IX |

741 745 750 755 760

375 370 365 360 355 351

SHAMMAKH

UMM SUWWANA

BIR KHIDAD

possible ancient track

Khatt Shabib
198,219,220

via nova Traiana

Wadi Arja

UDHRUH

Khatt Shabib
(transcribed from 1:50,000)

Legend

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

0 5km

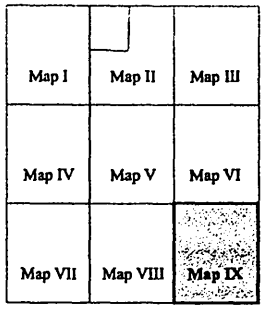
SCALE 1:125,000 @ A3

Figure 91
DAS Map VIII

# MAP IX

## WADI ABU EL HAMAN

From 1:50,000 Series K737, 3150 I.
Edition 1 AMS (UTM Grid)




765 770 775 780 785

375 370 365 360 355 350

Jabal Unaiza 201 1000m

Qalat Unaiza 389

MAHATTAT UNAIZA

Track to Jafr

Ghadir Abu Safat 406

MAHATTAT ABU JURDAN

1000m

1100m

Legend

- International Border
- Modern Town
- Road
- Track
- Railway
- Wadi Route
- 162 DAS Site
- Ancient Road
- Ancient Wall Line

N

0 5km

SCALE 1:125,000 @ A3

Figure 92
DAS Map IX

| Site Type | No. of types | % of total sample |
|---|---|---|
| Built Structure | 252 | 60% |
| Road and ancillary features | 53 | 13% |
| Mortuary sites | 30 | 7% |
| Artefact scatters | 25 | 6% |
| Enclosures | 24 | 6% |
| Campsites | 7 | 2% |
| Water structures | 9 | 2% |
| Caves | 5 | 1% |
| Fields/terraces | 4 | 1% |
| Walls | 5 | 1% |
| Carved features | 2 | 0.5% |
| Graffiti | 1 | 0.25% |
| Mine | 1 | 0.25% |

Table 15 DAS Site types

| Structure site type | No. Of types | % of sample |
|---|---|---|
| Structure(s) | 92 | 36% |
| Settlement | 57 | 22% |
| Tower | 41 | 16% |
| Farmsteads | 29 | 12% |
| Fort | 9 | 4% |
| Road Station | 9 | 4% |
| Caravanserai | 6 | 2% |
| Religious structures | 5 | 2% |
| 20th Century structures | 4 | 2% |

Table 16 DAS Structural sites by type

| | |
|---|---|
| Total sherds | 21483 |
| Total weight | 864.653kg |
| Diagnostic sherds | 10956 |
| Diagnostic weight | 192.589kg |
| Rims | 3843 |
| Rims weight | 56.108kg |
| Bases | 1186 |
| Handles | 2073 |
| Decorated bodies | 3773 |
| Other | 81 |

Table 17 DAS Raw Sherd Counts

| Period | Sherd Counts |
|---|---|
| Prehistoric | 1 |
| Chalcolithic/Early Bronze Age | 28 |
| Chalcolithic | 10 |
| Early Bronze Age | 40 |
| Middle Bronze Age | 4 |
| Iron Age II | 602 |
| Nabataean | 492 |
| Nabataean/Early Roman | 1335 |
| Roman | 270 |
| Early Roman | 68 |
| Late Roman | 377 |
| Late Roman/Early Byzantine | 729 |
| Roman/Byzantine | 84 |
| Byzantine | 475 |
| Early Byzantine | 129 |
| Late Byzantine | 49 |
| Late Byzantine/Early Islamic | 141 |
| Classical | 3 |
| Islamic | 11 |
| Early Islamic | 128 |
| Early/Middle Islamic | 37 |
| Middle Islamic | 283 |
| Middle/Late Islamic | 189 |
| Late Islamic | 7 |
| Ottoman | 6 |
| Hashemite | 6 |

Table 18 DAS sherds counts by period

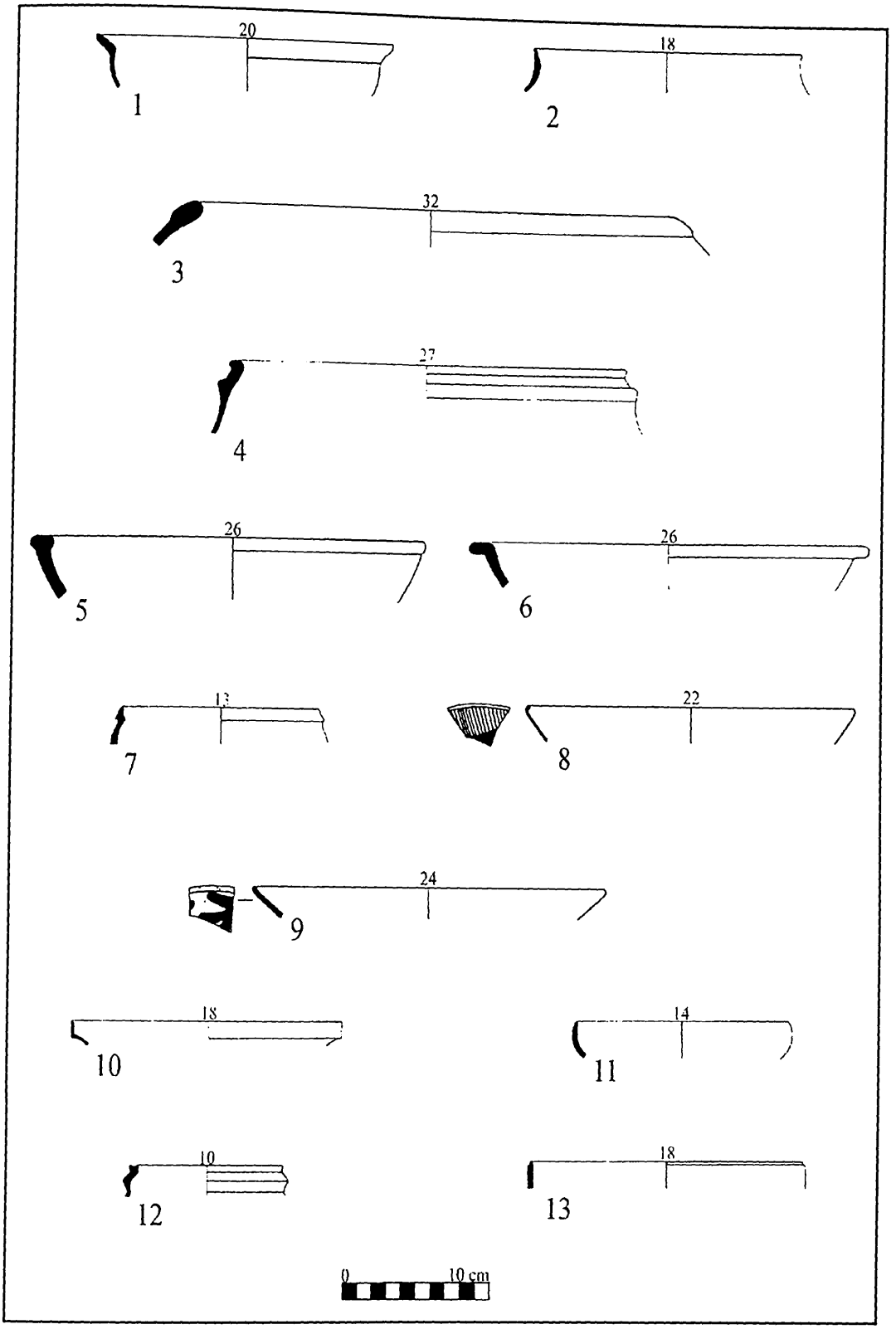



Figure 93 (1) bowl, late Iron Age (2) jar, late Iron Age (3) holemouth jar, late Iron Age (4) cooking pot, late Iron Age (5) bowl, late Iron Age (6) bowl, late Iron Age (7) cooking pot, Nabataean 2nd century AD (8) painted fine ware bowl, Nabataean 1st-2nd century AD (9) painted fine ware bowl, Nabataean1st-2nd century AD (10) unpainted fine ware bowl, Nabataean (11) unpainted fine ware bowl, Nabataean (12) closed cooking pot, Late Roman (13) bowl, Late Roman

| Fig No. | Form | Characterisation | Dominant Inclusions | Colour and Decorative Features |
|---|---|---|---|---|
| 1 | Bowl | Ext. feel: rough<br>Int. feel: rough<br>Hardness: hard<br>Texture: irregular | Moderate sub-angular quartz about 1 mm in size, poorly sorted frequent sub-angular ovoid red-brown mineral inclusions 0.5 to 2 mm in size, infrequent sub-angular black mineral inclusions about 1 mm in size. | Int.: 5YR 6/4 (light reddish brown)<br>Ext.: 7.5YR 7/4 (pink)<br>Core: 7.5YR 7/4 (pink) |
| 2 | Jar | Ext. feel: smooth<br>Int. feel: rough<br>Hardness: hard<br>Texture: irregular | Moderate poorly sorted sub-angular calcite 0.5 to 3 mm in size, frequent poorly sorted angular ovoid red-brown mineral inclusions 1 to 5 mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 10YR 7/1 (light grey) |
| 3 | Jar | Ext. feel: rough<br>Int. feel: rough<br>Hardness: hard<br>Texture: irregular | Moderate poorly sorted sub-angular calcite 1-4 mm in size, frequent sub-angular quartz 1- 2 mm in size, frequent sub-angular dark grey mineral inclusions about 1 mm in size. | Int: 5YR 7/4 (pink)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 10R 5/4 (weak red) |
| 4 | Cooking Pot | Ext. feel: rough<br>Int. feel: rough<br>Hardness: hard<br>Texture: irregular | Very frequent sub-angular to angular quartz 1 to 2 mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 5YR 6/6 (reddish yellow) |
| 5 | Bowl | Ext. feel: rough<br>Int. feel: rough<br>Hardness: hard<br>Texture: irregular | Infrequent sub-angular quartz 1 to 2 mm in size, frequent poorly sorted angular ovoid grey mineral inclusions 0.5 to 4 mm in size, infrequent poorly sorted angular calcite 1 to 4 mm in size. | Int.: 5YR 6/4 (light reddish yellow)<br>Ext.: 5YR 6/3 (light reddish yellow)<br>Core: 7.5YR 6/0 (grey) |
| 6 | Bowl | Ext. feel: rough<br>Int. feel: smooth<br>Hardness: hard<br>Texture: irregular | Very frequent dark grey and black sub-angular mineral inclusions about 1 mm in size, infrequent sub-angular calcite about 1 mm in size. | Int: 7.5YR 7/6 (reddish yellow)<br>Ext.: 10YR 8/3 (very pale brown)<br>Core: 10YR 7/1 (light grey) |
| 7 | Cooking Pot | Ext. feel: rough<br>Int. feel: rough<br>Hardness: very hard<br>Texture: irregular | Frequent sub-angular quartz 0.5 to 1 mm in size, moderate dark grey sub-angular mineral inclusions about 1 mm in size. | Int.: 2.5YR 6/6 (light red)<br>Ext.: 2.5YR 6/6 (light red)<br>Core: 10YR 6/1 (grey)<br>Ext. slipped: 10YR 8/3 (very pale brown) |
| 8 | Bowl | Ext. feel: very smooth<br>Int. feel: very smooth<br>Hardness: very hard<br>Texture: very fine | Frequent calcite < 0.5 in size, infrequent sub-rounded dark grey mineral inclusions < 0.5 mm in size. | Int.: 2.5YR 6/8 (light red)<br>Ext.: 2.5YR 6/6 (light red)<br>Core: 2.5YR 5/0 (grey)<br>Int. painted: 2.5YR 5/4 (reddish brown) |
| 9 | Bowl | Ext. feel: very smooth<br>Int. feel: very smooth<br>Hardness: very hard<br>Texture: very fine | Frequent calcite < 0.5 mm in size, infrequent sub-rounded dark grey mineral inclusions < 0.5 mm in size. | Int.: 2.5YR 5/6 (red)<br>Ext.: 2.5YR 5/6 (red)<br>Core: 2.5YR5/6 (red)<br>Int. painted: 5YR 3/2 (dark reddish brown) |
| 10 | Bowl | Ext. feel: smooth<br>Int. feel: smooth<br>Hardness: very hard<br>Texture: fine | Frequent calcite < 0.5 mm in size, frequent dark grey mineral inclusion < 0.5 mm in size. | Int.: 2.5YR 6/6 (light red)<br>Ext.: 2.5YR 6/6 (light red<br>Core: 2.5YR 6/6 (light red)<br>Ext. slipped: 10YR 8/4 (very pale brown) |
| 11 | Bowl | Ext. feel: rough<br>Int. feel: smooth<br>Hardness: hard<br>Texture: fine | Frequent sub-rounded calcite 0.2 to 1 mm in size, infrequent sub-angular ovoid red-brown mineral inclusions 1 to 2 mm in size, pale brown angular ovoid mineral inclusions 1 to 2 mm in size. | Int.: 2.5YR 6/6 (light red)<br>Ext.: 2.5YR 6/6 (light red)<br>Core: 2.5YR 6/6 (light red) |
| 12 | Cooking Pot | Ext. feel: smooth<br>Int. feel: rough<br>Hardness: hard<br>Texture: fine | Frequent sub-angular quartz 1 mm in size, infrequent sub-angular calcite 1 mm in size, moderate dark grey mineral inclusions 0.5 to 1 mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 5YR 6/6 (reddish yellow)<br>Ext. slipped: 10YR 8/4 (very pale brown) |
| 13 | bowl | Ext. feel: very smooth<br>Int. feel: very smooth<br>Hardness: very hard<br>Texture: very fine | Infrequent dark grey sub-rounded mineral inclusions 0.5 to 1 mm in size, infrequent sub-angular quartz 1 mm in size, infrequent sub-angular calcite 1 mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 5YR 6/6 (reddish yellow) |

Table 19
DAS Ceramic description for
Figure 93

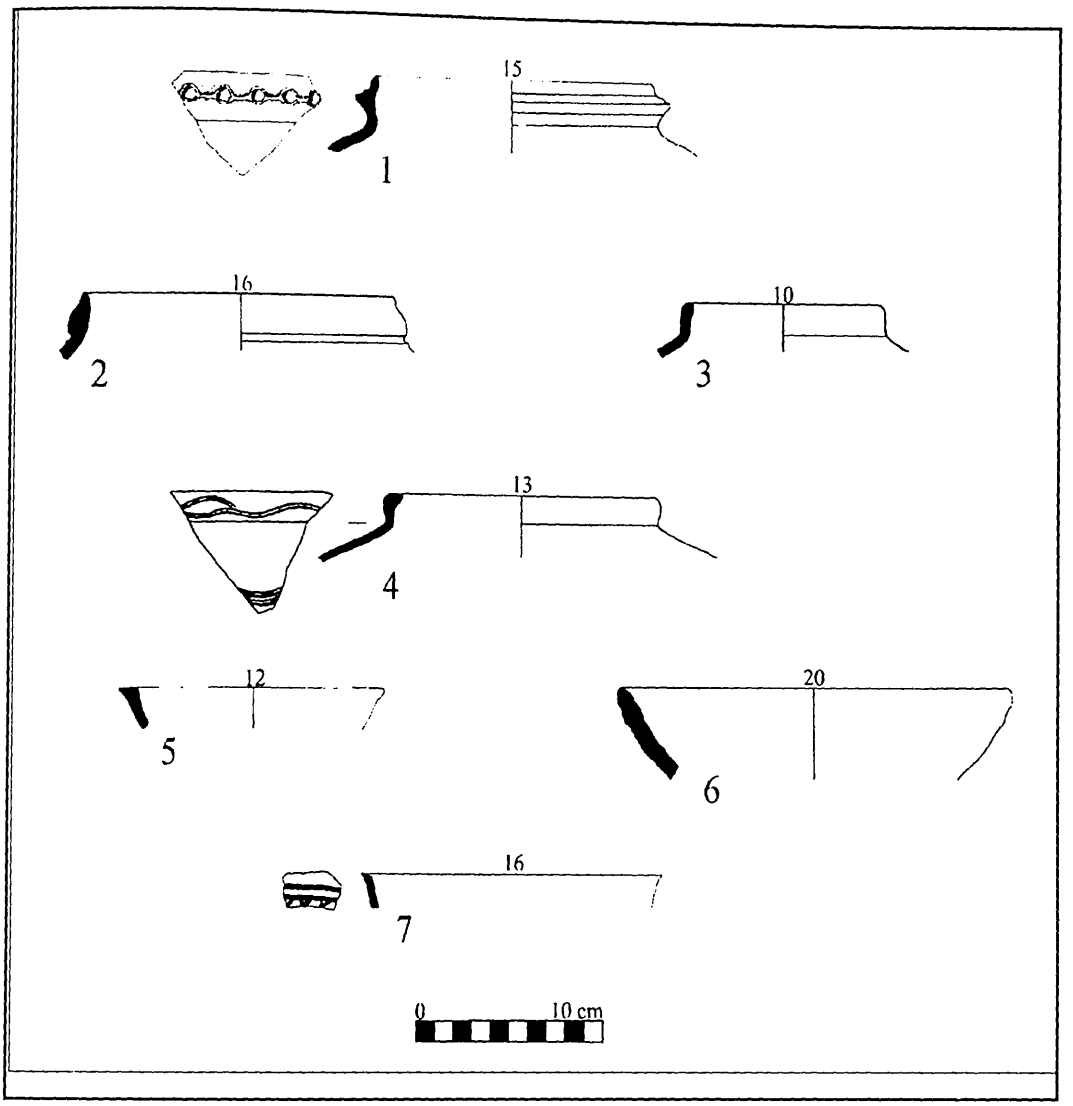



Figure 94 (1) jar with 'pie-crust' rim, Late Byzantine (2) jar, Byzantine 5th century AD (3) closed cooking pot, Late Byzantine (4) jar with incised decoration, Late Byzantine (5) bowl, Middle Islamic handmade ware (6) bowl, Middle Islamic handmade ware (7) bowl, Middle Islamic handmade geometrically-painted ware

| Fig no | Form | Characteristics | Dominant Inclusions | Colour and Decorative Features |
|---|---|---|---|---|
| 1 | Jar | Ext. feel: rough<br>Int. feel: rough<br>Hardness: very hard<br>Texture: irregular | Moderate black sub-angular mineral inclusions about 1 mm in size, frequent sub-angular quartz about 1 mm in size, infrequent sub-rounded calcite about 1mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 5YR 6/6 (reddish yellow)<br>Ext. slipped: 5YR 5/1 (grey)<br>'pie-crust' decoration on neck of jar |
| 2 | Jar | Ext. feel: rough<br>Int. feel: rough<br>Hardness: very hard<br>Texture: irregular | Very frequent sub-angular quartz 1 to 2 mm in size, moderate pale brown angular ovoid mineral inclusions 2 to 4 mm in size, infrequent sub-angular calcite about 1 mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 6/6 (reddish yellow)<br>Core: 10YR 6/1 (grey)<br>Ext. slipped: 10YR 5/1 (grey) |
| 3 | Cooking Pot | Ext. feel: rough<br>Int. feel: rough<br>Hardness: very hard<br>Texture: irregular | Moderate angular quartz about 1 mm in size, moderate sub-angular red-brown mineral inclusions about 0.5 mm in size, moderate sub-angular dark grey mineral inclusions 0.5 mm in size. | Int.: 2.5YR 6/6 (light red)<br>Ext.: 2.5YR 6/6 (light red)<br>Core: 2.5YR 6/6 (light red)<br>Ext. slipped: 10YR 5/2 (greyish brown) |
| 4 | Jar | Ext. feel: rough<br>Int. feel: rough<br>Hardness: very hard<br>Texture: irregular | Frequent dark grey sub-rounded mineral inclusions < 0.5 to 1 mm in size, moderate sub-angular quartz about 1 mm in size, infrequent sub-angular calcite 1 to 4 mm in size. | Int.: 5YR 7/4 (pink)<br>Ext.: 5YR 7/4 (pink)<br>Core: 5YR 5/1 (grey)<br>Ext. slipped: 10YR 5/1 (grey)<br>Wavy band combing on neck and shoulder of jar |
| 5 | Bowl | Ext. feel: rough<br>Int. feel: smooth<br>Hardness: hard<br>Texture: irregular | Frequent burnt out organic inclusions, frequent pale brown rounded mineral inclusions about 1 mm in size. | Int.: 5YR 6/6 (reddish yellow)<br>Ext.: 5YR 7/4 (pink)<br>Core: 7.5YR 3/0 (very dark grey)<br>Int. and ext. slipped: 10R 5/6 (red) |
| 6 | Bowl | Ext. feel: very rough<br>Int. feel: very rough<br>Hardness: very hard<br>Texture: very irregular | Very frequent burnt out organic inclusions, infrequent sub-angular calcite about 1 mm in size, moderate white angular ovoid mineral inclusions 5 to 10 mm in size, frequent dark grey angular ovoid mineral inclusions 2 mm in size. | Int.: 5YR 7/6 (reddish yellow) – 2.5Y 7/2 (light grey)<br>Ext.: 10YR 6/3 (pale brown) – 2.5YR 6/8 light red<br>Core: 2.5YR 3/0 (very dark grey)<br>Ext. slipped: 10YR 6/3 (pale brown) – 2.5YR 6/8 light red<br>Int. slipped: 5YR 7/6 (reddish yellow) – 2.5Y 7/2 (light grey) |
| 7 | Bowl/Jar | Ext. feel: smooth<br>Int. feel: smooth<br>Hardness: very hard<br>Texture: irregular | Frequent burnt out organic inclusions, moderate sub-angular calcite 1 to 2 mm in size, moderate angular ovoid dark grey mineral inclusions 1 to 2 mm in size. | Int.: 2.5YR 6/6 (light red)<br>Ext.: 2.5YR 6/6 (light red)<br>Core: 2.5YR 4/0 (dark grey)<br>Ext. and int. slipped: 2.5YR 6/6 (light red)<br>Painted geometric designs on the exterior: 2.5YR 2.5/0 (black) |

Table 20 DAS Ceramic description for Figure 94

| DAS Site No. | Prehistoric | IA | Nab | Early Roman | Late Roman | Early Byz | Late Byz | Early Islamic | Middle Islamic | Late Islamic |
|---|---|---|---|---|---|---|---|---|---|---|
| 188* | | | X | X | X | | | X | X | X |
| 192* | | X | X | X | X | X | X | X | | |
| 191 | | | | | | | | | | |
| 189 | | | | X | X | | | | | |
| 345 | | | X | | | | | | X | |

Table 21 Wadi Arabah sites

| DAS Site No. | Prehistoric | IA | Nab | Early Roman | Late Roman | Early Byz | Late Byz | Early Islamic | Middle Islamic | Late Islamic |
|---|---|---|---|---|---|---|---|---|---|---|
| 191 | | | | | | | | | | |
| 129 | X | | | | | | | | | X |
| 154 | | | | | | | | | | |
| 153 | | | X | X | X | X | X | X | X | X |
| 155 | | X | | X | X | X | X | | | |
| 180 | | | | | | | | | | |
| 5 | | | X | X | X | X | X | X | X | X |
| 9 | | | X | X | X | | X | X | X | |
| 8 | | | | X | X | X | X | X | | |

Table 22 Wadi Dahal sites

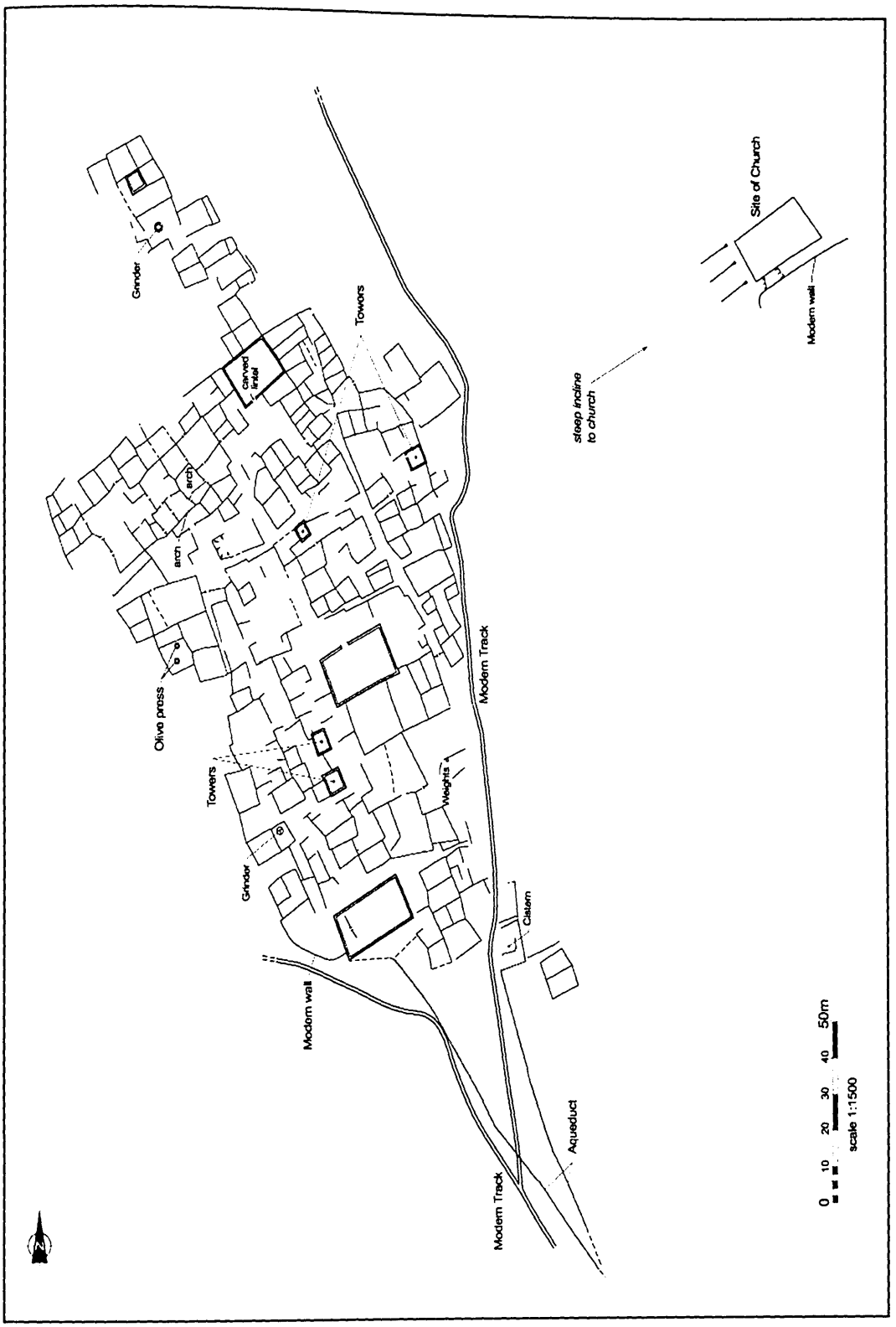



Figure 95 Plan DAS 5 Khirbat Nusraniyah

| DAS Site No. | Prehistoric | IA | Nab | Early Roman | Late Roman | Early Byz | Late Byz | Early Islamic | Middle Islamic | Late Islamic |
|---|---|---|---|---|---|---|---|---|---|---|
| 190 | | | X | X | X | X | X | | | |
| 181 | | | | | | X | X | | | |
| 182 | | | | | | | | | | |
| 185 | X | | | | | | | | | |
| 186 | | | X | X | X | X | X | X | | |
| 187 | | | X | X | X | X | X | | | |
| 63 | X | X | X | X | X | X | X | X | X | |
| 4 | | | X | X | X | X | X | | X | X |
| 54 | | X | X | X | X | X | X | | X | X |
| 60 | | | X | X | X | X | X | | | |
| 6 | | X | X | X | X | X | X | X | X | X |
| 2 | | | | | | | | | | |

Table 23 Faynan-Dana sites

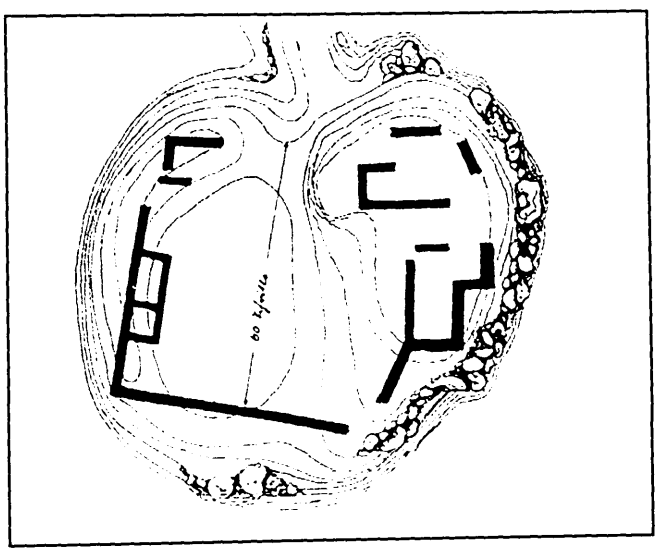


Figure 96 Frank's plan Abu Dhibana (DAS 190).
*From Frank 1934 Plan 18B*

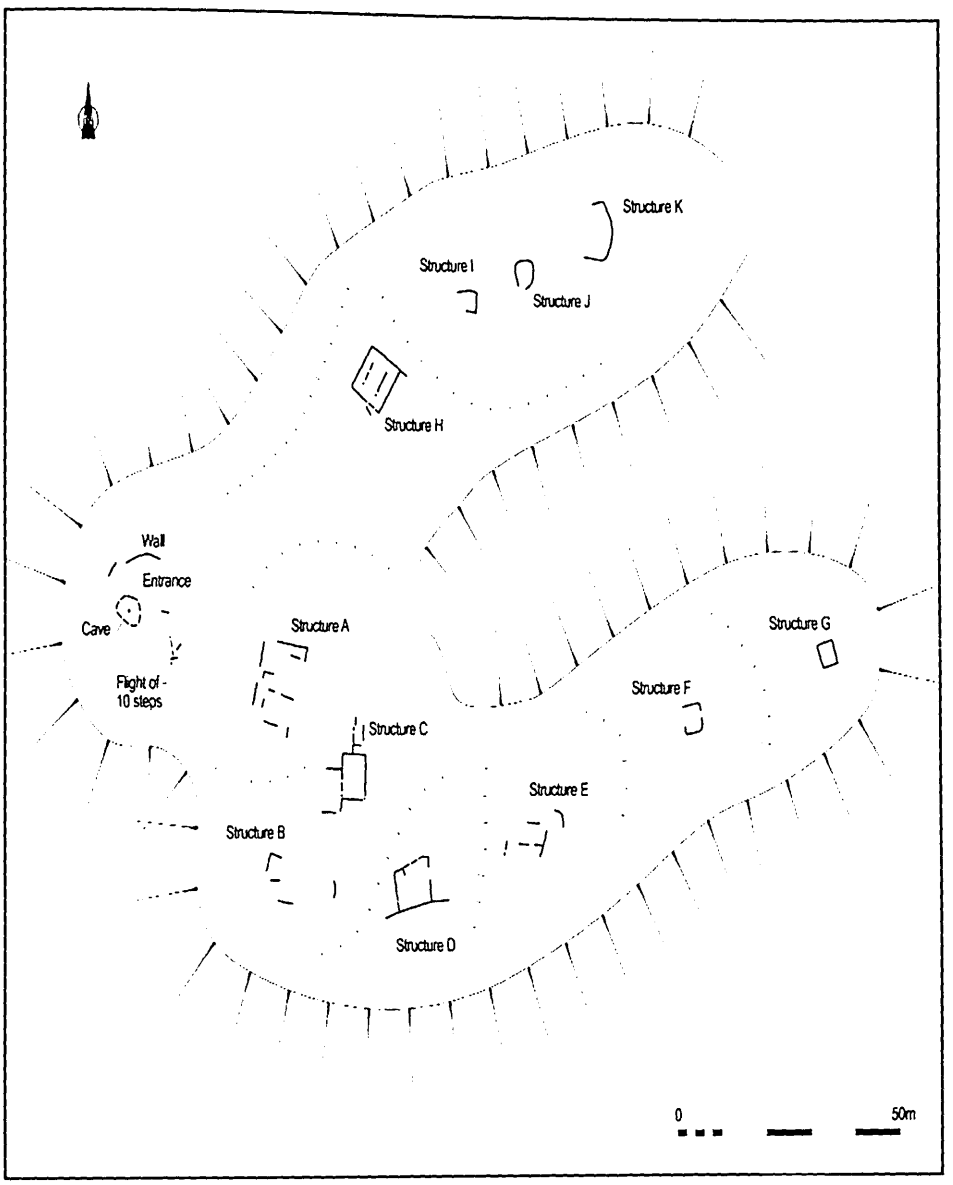



Figure 97 Plan DAS 187 Tell El Mirad

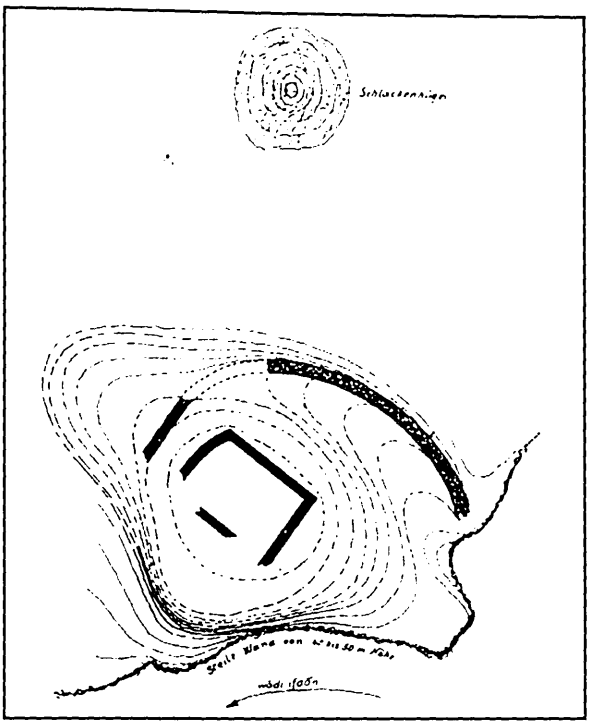


Figure 98 Frank's plan Rujm Fidan (DAS 186)
Scale 1:400. *From Frank 1934 Plan 18A*

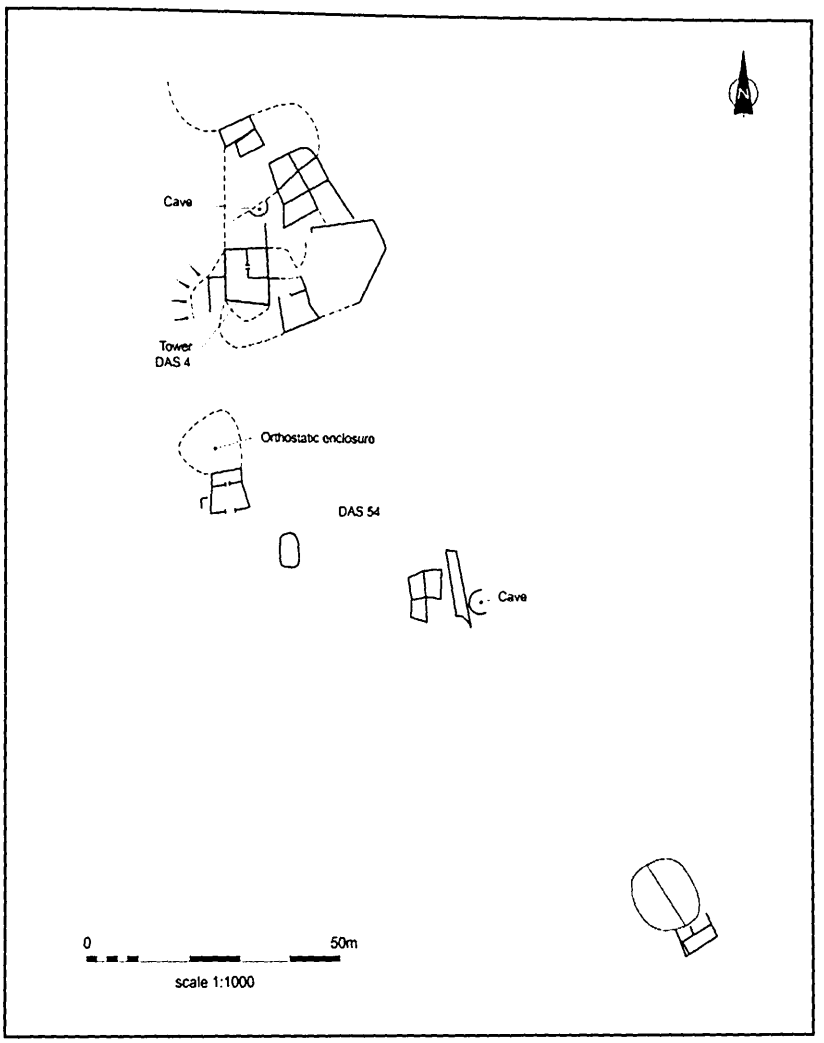



Figure 99 Plan DAS 4 & 54 Khirbat Maqtah

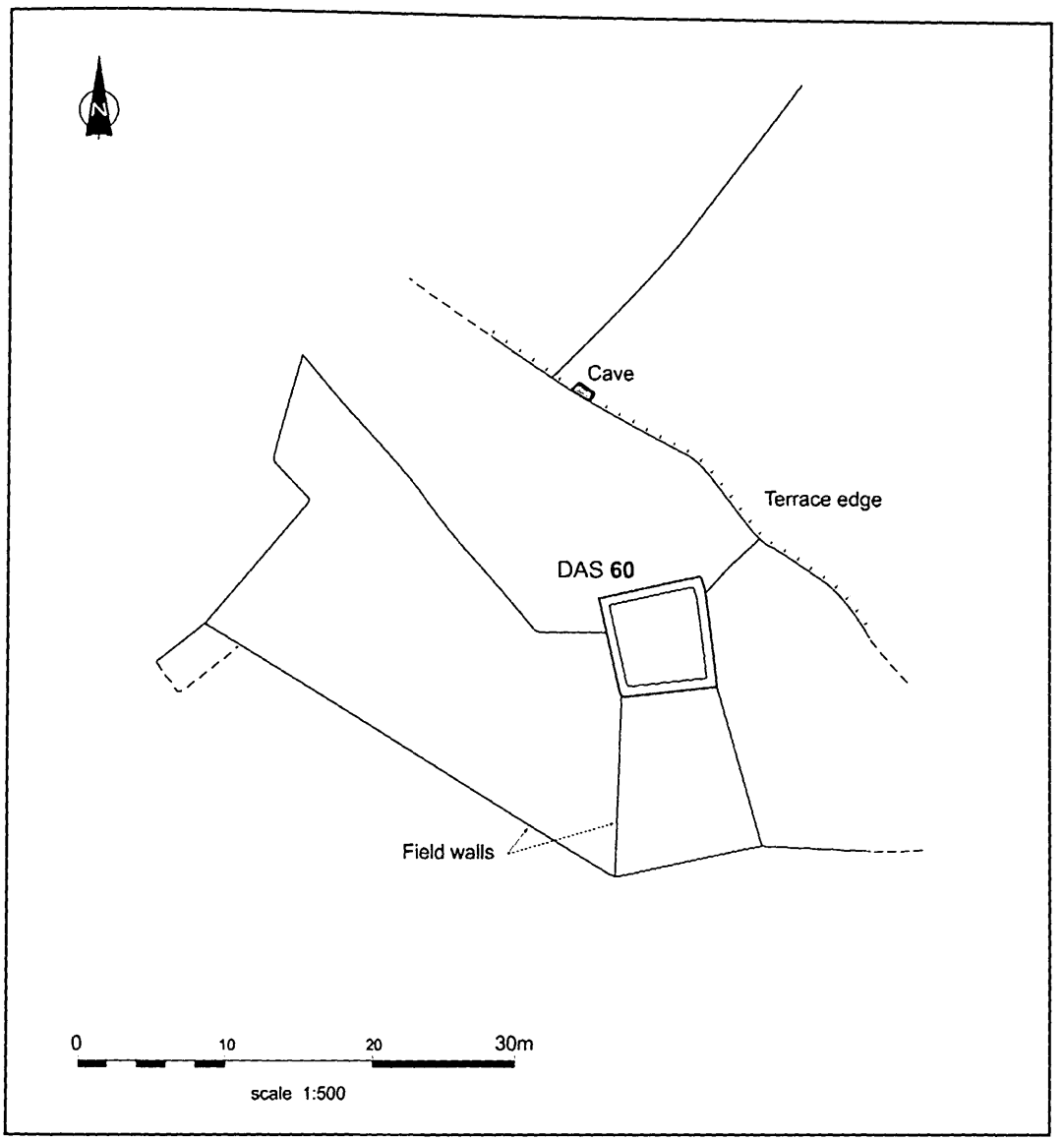



Figure 100 Plan DAS 60 Khirbat Er Rummana

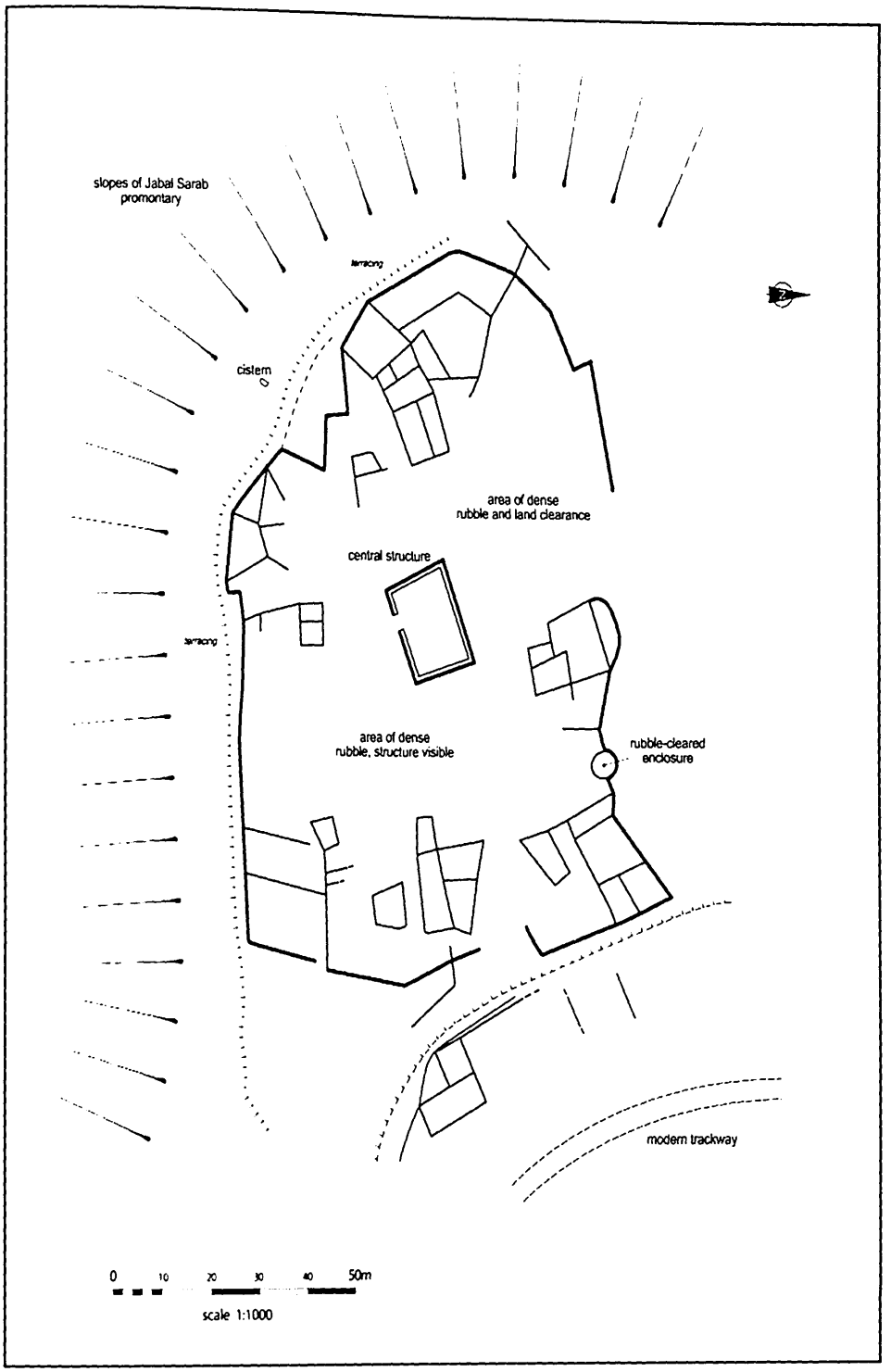



Figure 101 Plan DAS 6 Khirbat Sarab

| DAS Site No | Nabataean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Middle Islamic | Late Islamic |
|---|---|---|---|---|---|---|---|---|
| 209 | X | X | X | X | X | | | |
| 210 | X | X | X | X | X | | | |
| 207 | X | X | X | X | X | | | |
| 353 | | | | X | X | | | |
| 112 | X | X | X | X | | | | |
| 114 | X | X | X | | | | | |
| 135 | | | | | X | X | | |
| 136 | X | X | X | X | X | | | |
| 160 | X | X | | | X | X | X | X |
| 138 | X | X | | | | | | |
| 142 | X | X | | | | | | |
| 143 | X | X | X | X | X | | | |
| 144 | X | X | X | X | X | X | | |
| 145 | X | X | X | X | X | | | |
| 147 | X | X | X | X | X | | | |
| 148 | X | X | X | X | X | | | |
| 247 | X | X | X | | | | | |
| 340 | X | X | X | X | | | | |
| 339 | X | X | X | X | X | | | |

Table 24 All sites on *via nova Traiana*

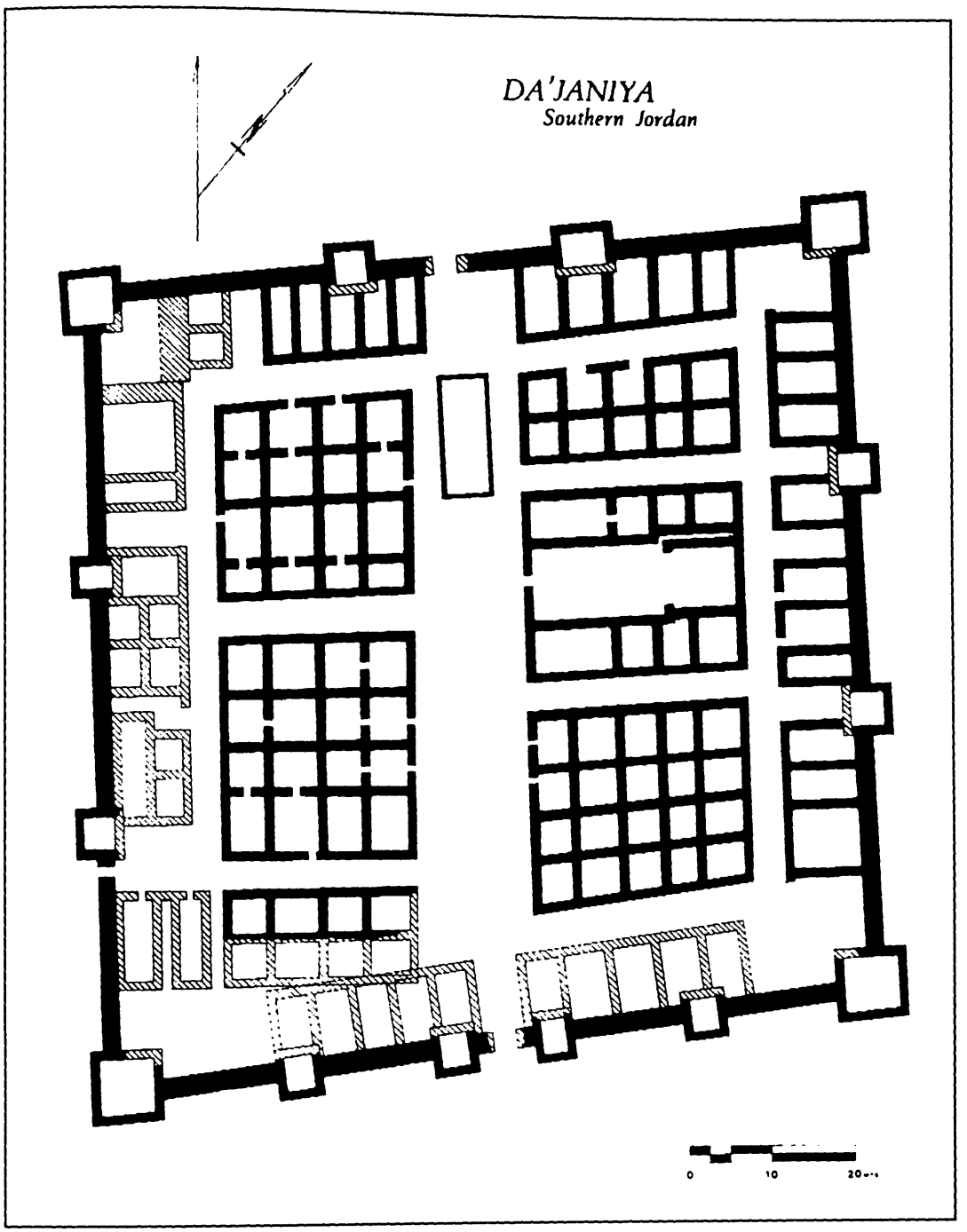



Figure 102 Freeman's plan DAS 200 Khirbat Dajaniyah. *From Freeman 1990, 191 Fig. 2*

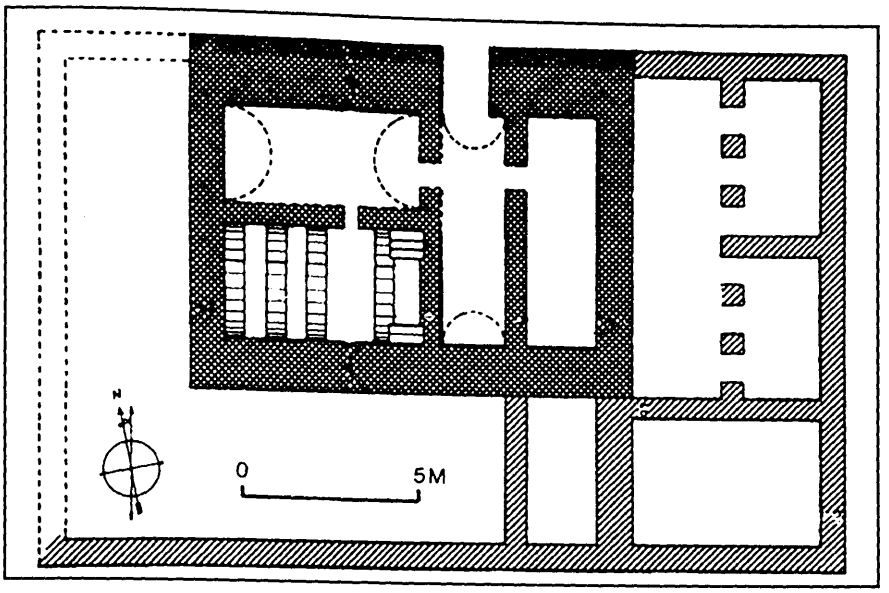



Figure 103 Brünnow & von Domaszewski's plan Qasr El Bint (DAS 236) *From Kennedy 2000, 161 Fig. 16.6*

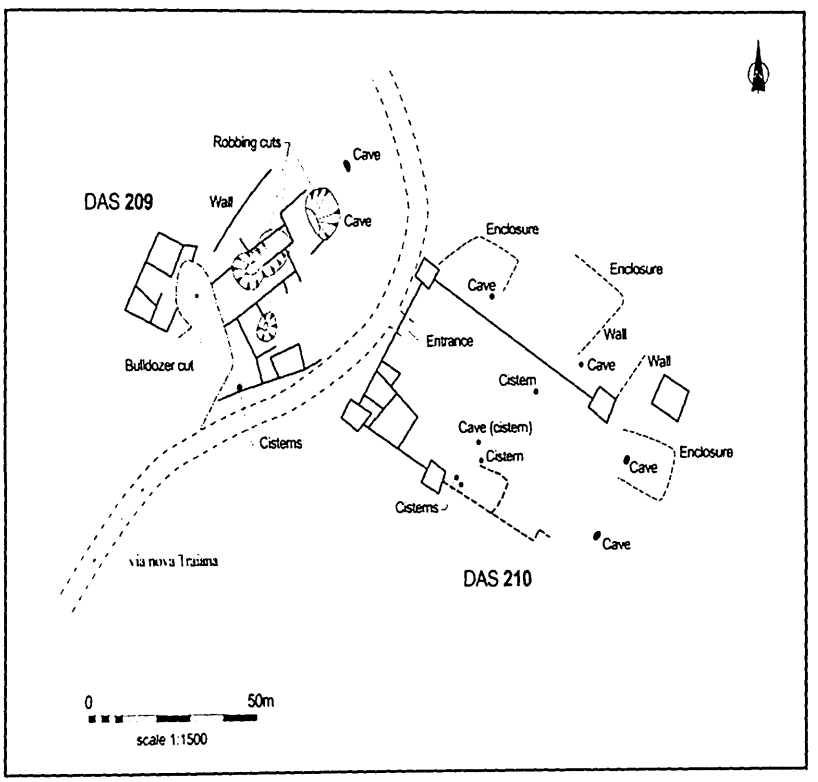



Figure 104 Plan DAS 209/210 Khirbat Hodiah

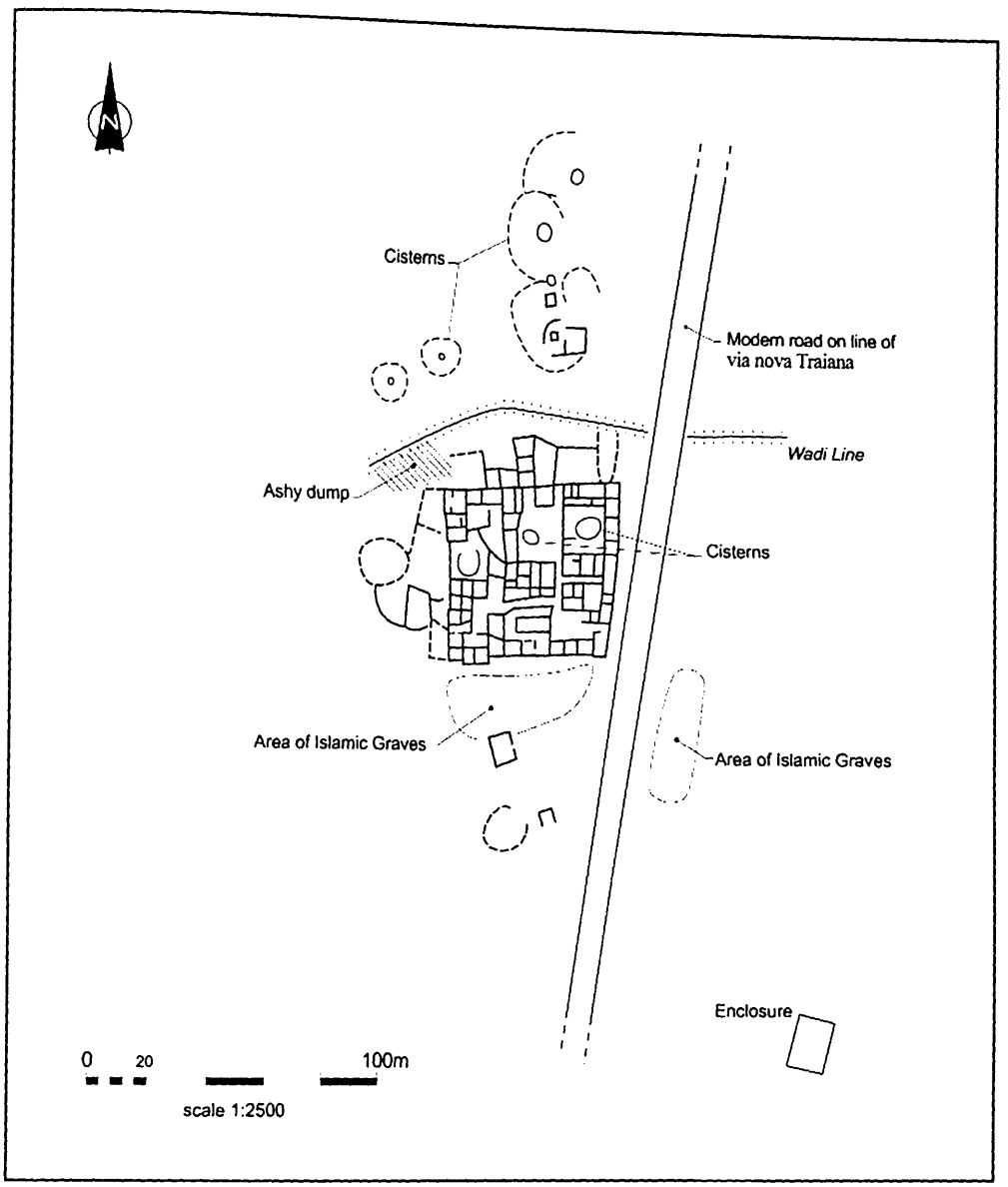



Figure 105 Plan DAS 160 Khirbat Samra

| DAS Site No | Site Size (m) | Date Range |
|---|---|---|
| 209 | c.30x30 | Nab to Late Byz |
| 207 | 24x34 | Nab to Late Byz |
| 353 | 26x27 | Early Byz to Late Byz |
| 112 | 29x22 | Nab to Early Byz |
| 114 | 20x29 | Nab to Late Roman |
| 136 | 30x23 | Nab to Late Byz |
| 247 | 20x16 | Nab to Late Roman |
| 341 | 30x21 | No sample |
| 340 | (40x20 rubble area) | Nab to Early Byz |
| 339 | 16x20 | Nab to Late Byz |

Table 25 Road stations on *via nova Traiana*

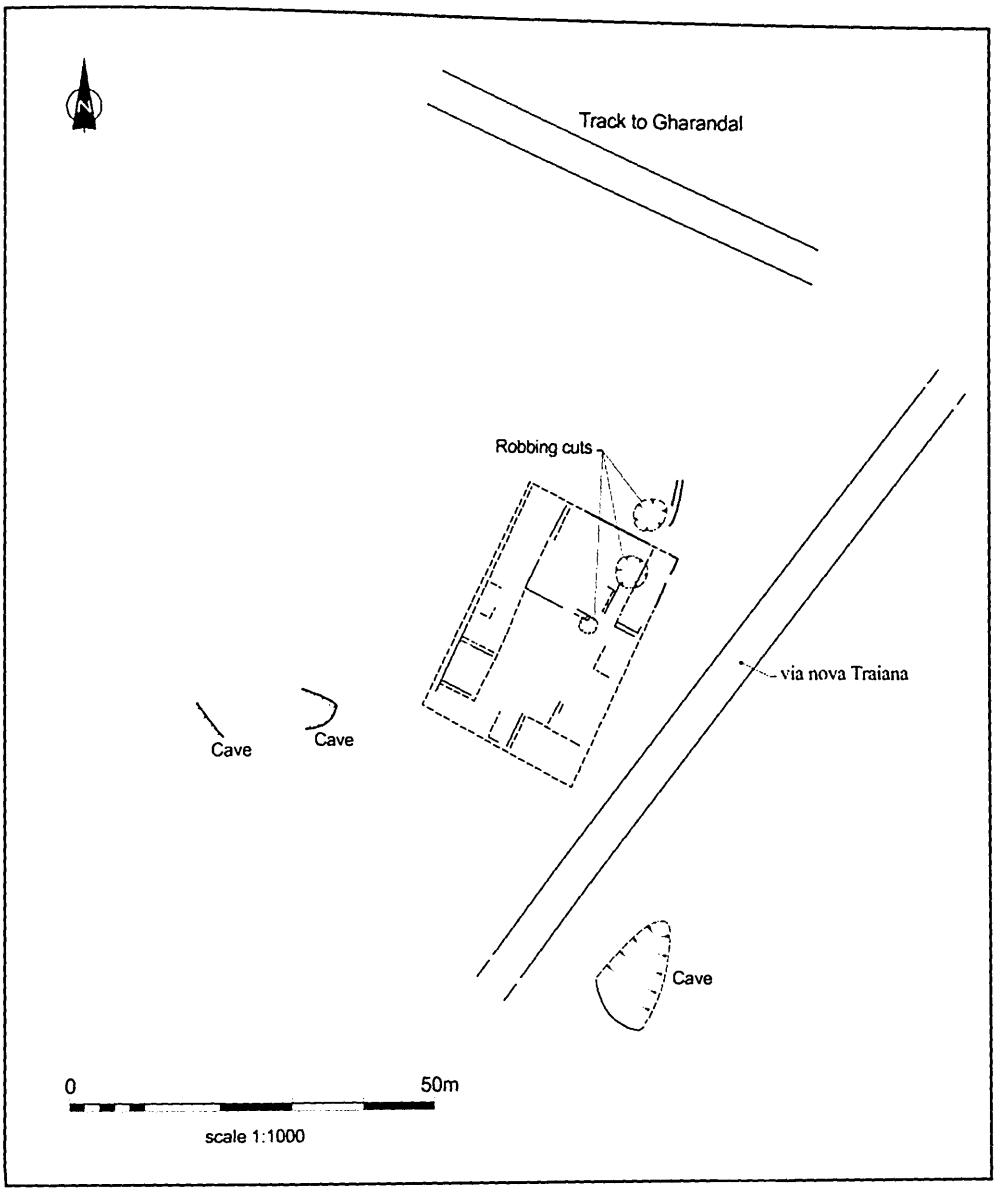



Figure 106 Plan DAS 207

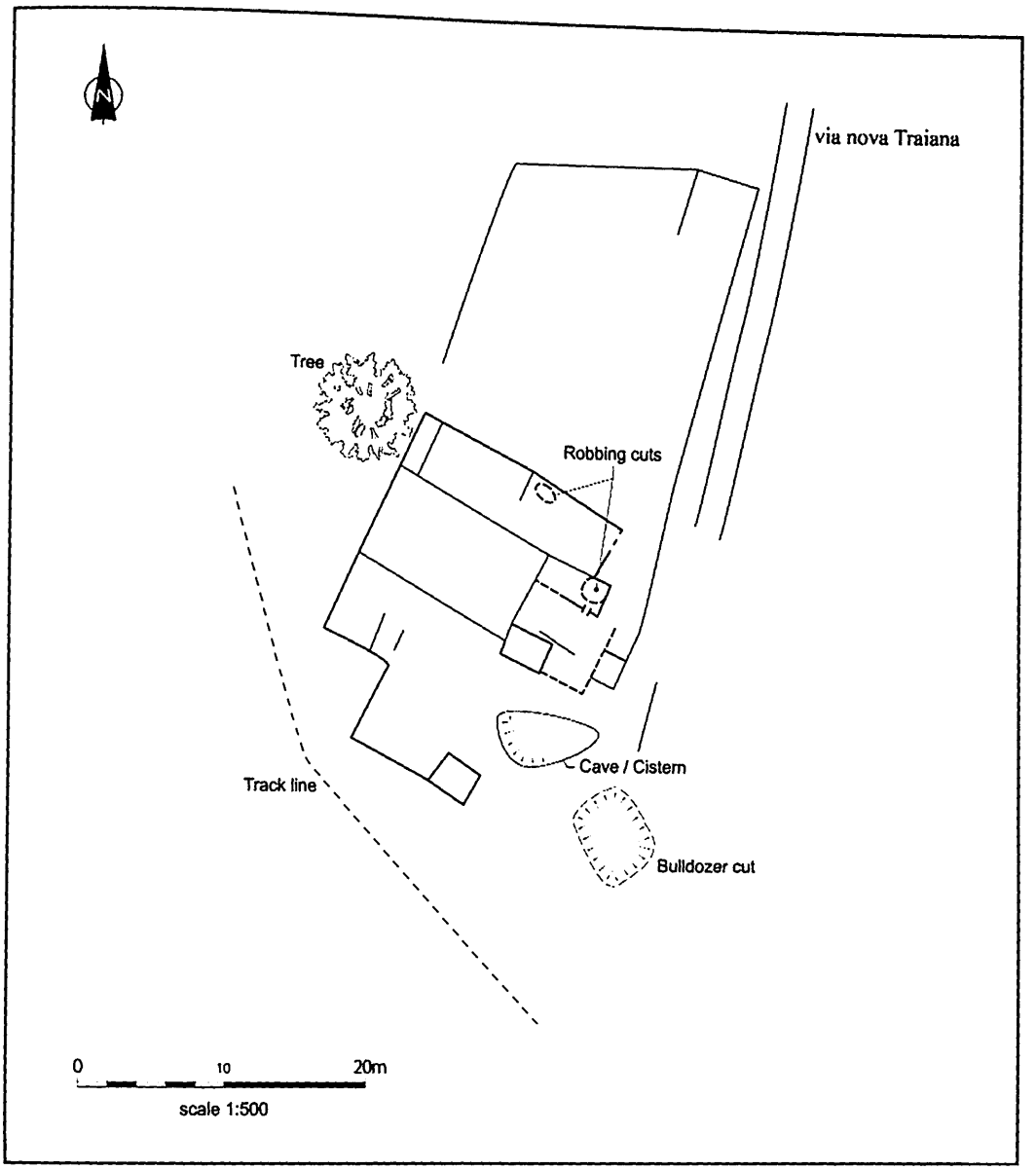



Figure 107 Plan DAS 114 Shajarat Et Tiyara

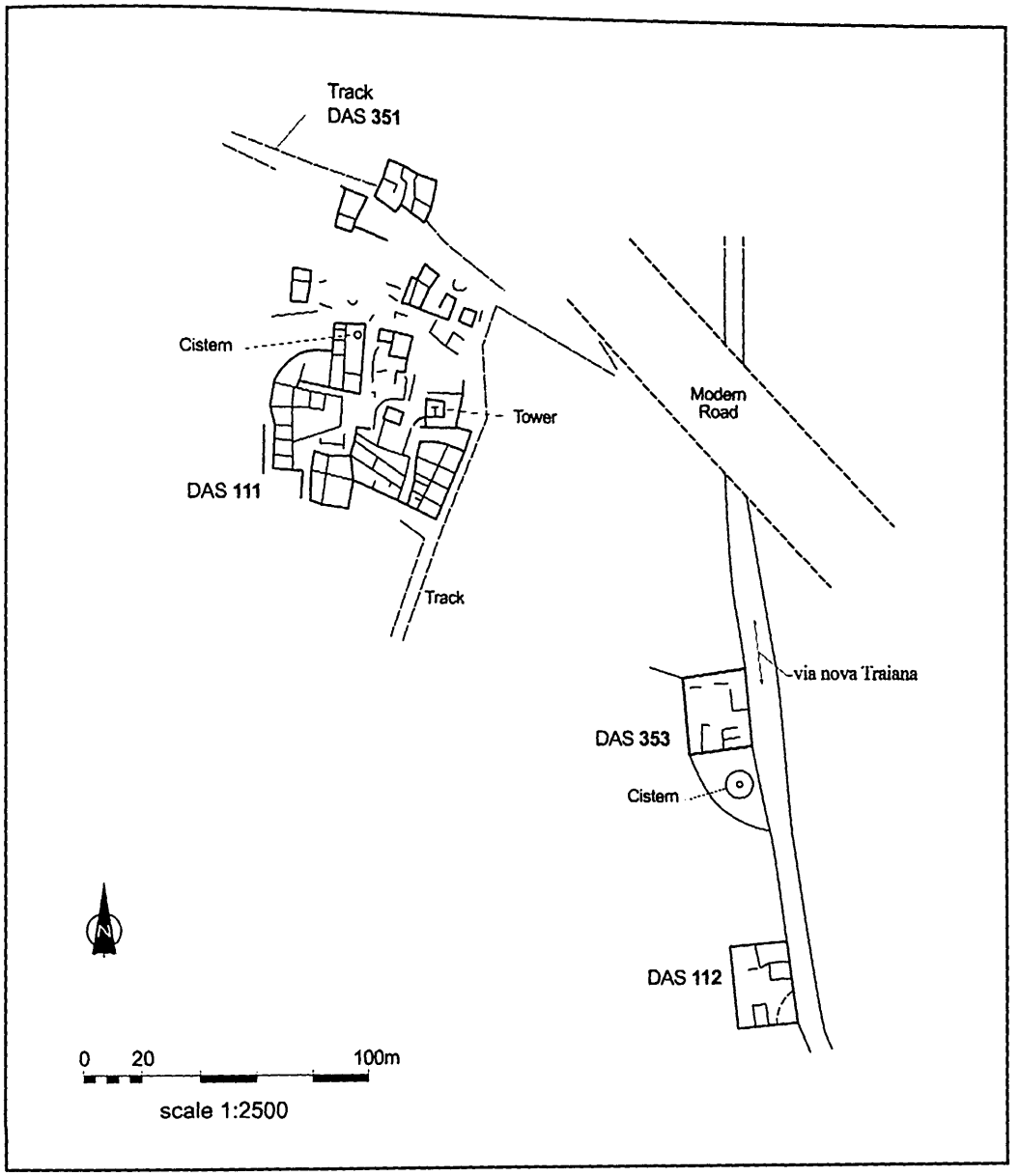



Figure 108 Plan DAS 111, 112 & 353 Khirbat Sumra

| DAS Site No. | Prehistoric | IA | Nab | Early Roman | Late Roman | Early Byz | Late Byz | Early Islamic | Middle Islamic | Late Islamic | Mod |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 401 | | | X | X | X | X | X | X | X | | |
| 295 | | | | X | X | X | X | X | X | | |
| 255 | | | X | X | X | X | | | | | |
| 276 | | | X | X | X | X | X | X | X | | |
| 275 | | | X | X | | X | X | | | | |
| 384 | | | X | X | X | X | | | | | |
| 383 | | | X | X | X | X | X | | | | |
| 258 | | | X | X | X | X | | | | | |
| 259 | | | | | | X | X | | | | |
| 257 | | | | | X | | | | | | |

Table 26 Udhruh to Nijil sites

| DAS Site No. | Prehistoric | IA | Nab | Early Roman | Late Roman | Early Byz | Late Byz | Early Islamic | Middle Islamic | Late Islamic | Mod |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 235 | | | | X | X | X | X | X | | | |
| 211 | | | | | X | X | X | | | | |
| 217 | | | X | X | X | X | X | | | | |
| 201 | | X | X | X | X | X | X | | | | |
| 389 | | X | X | | X | X | X | X | X | X | X |

Table 27 Sites on desert road

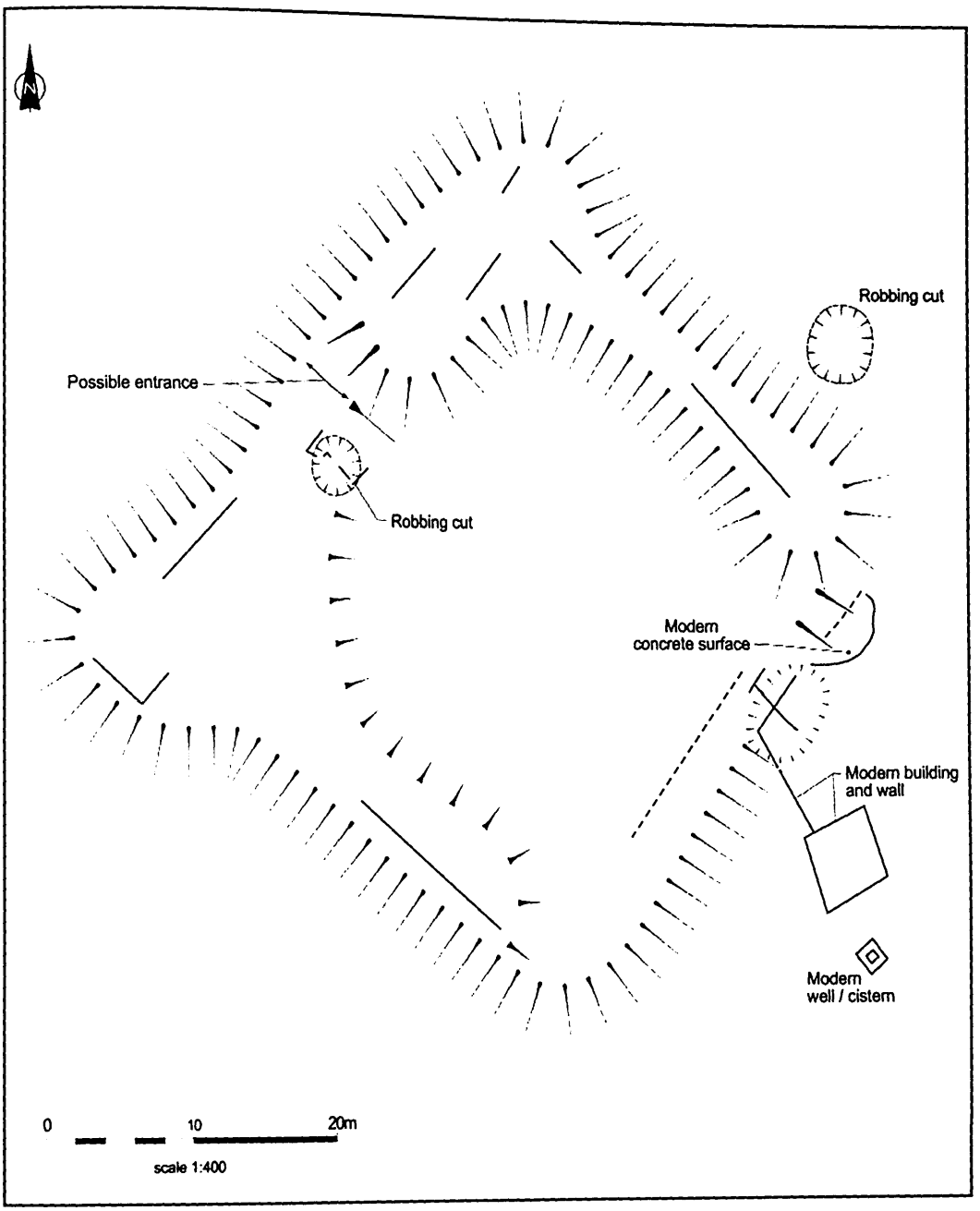



Figure 109 Plan DAS 235 Jurf Ed Darwish

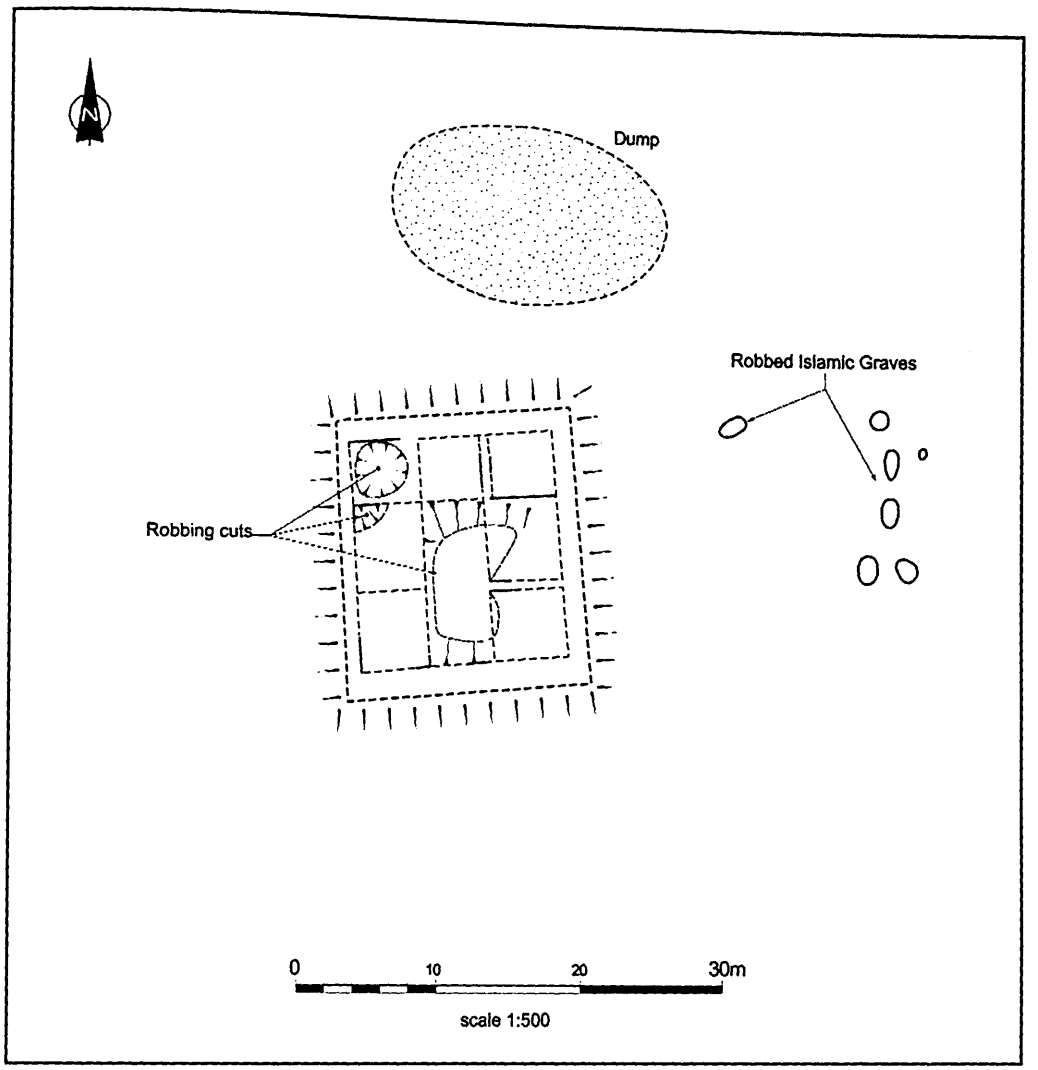



Figure 110 Plan DAS 217 Abu Hitana

Figure 111 Photo DAS 211 Desert route

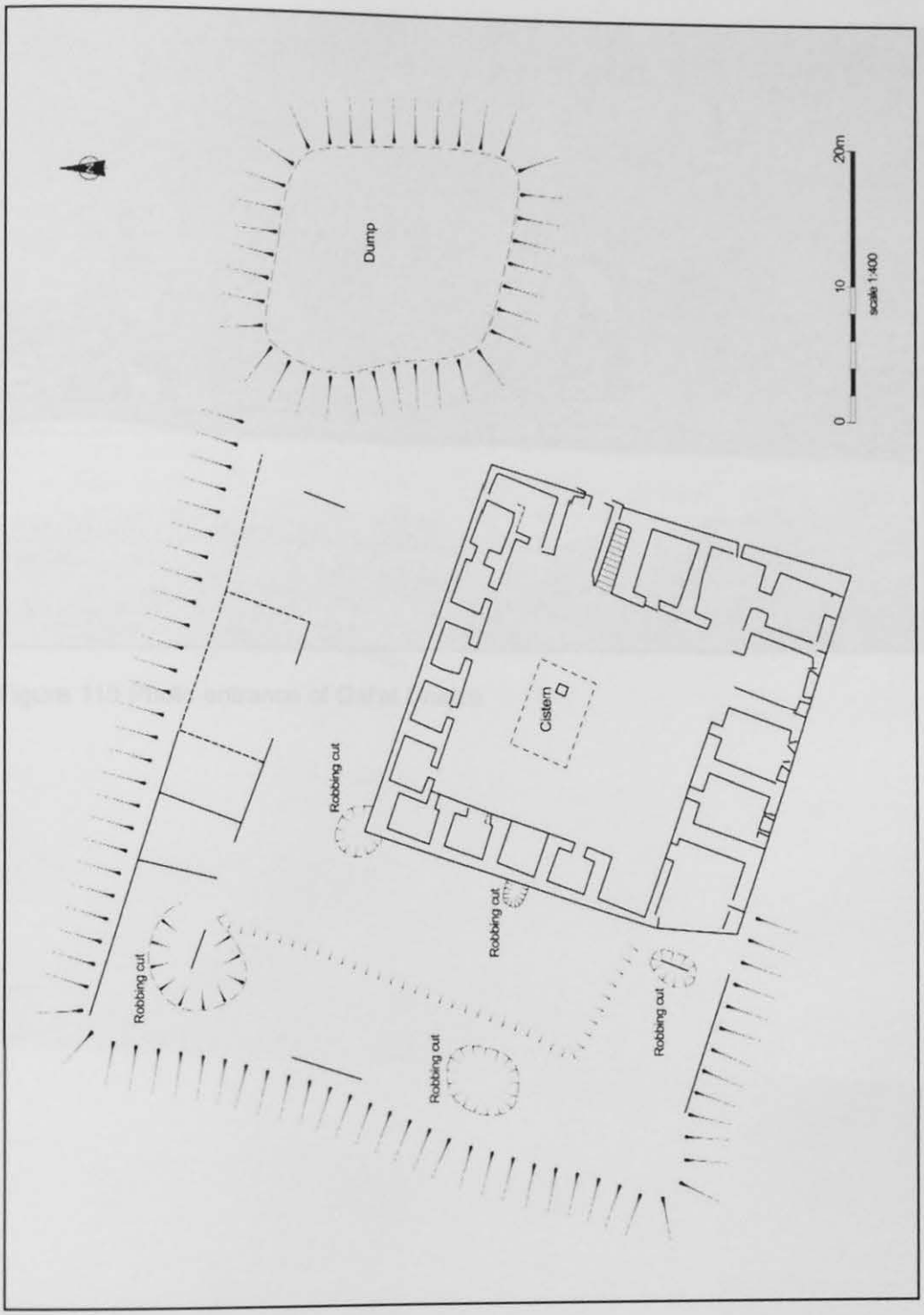



Figure 112 Plan DAS 189 Qal'at Unaiza. *Central structure from Peterson 1986, Figure X*

Figure 113 Photo entrance of Qal'at Unaiza

| DAS Site No. | Prehistoric | IA | Nab | Early Roman | Late Roman | Early Byz | Late Byz | Early Islamic | Middle/Late Islamic |
|---|---|---|---|---|---|---|---|---|---|
| 200* | | | X | X | X | X | X | | X |
| 193 | | | X | X | X | X | X | X | X |
| 194 | | | X | X | X | X | X | X | |
| 160 | | | X | X | | | X | X | |

Table 28 Cross route Ifjeij plain and military sites

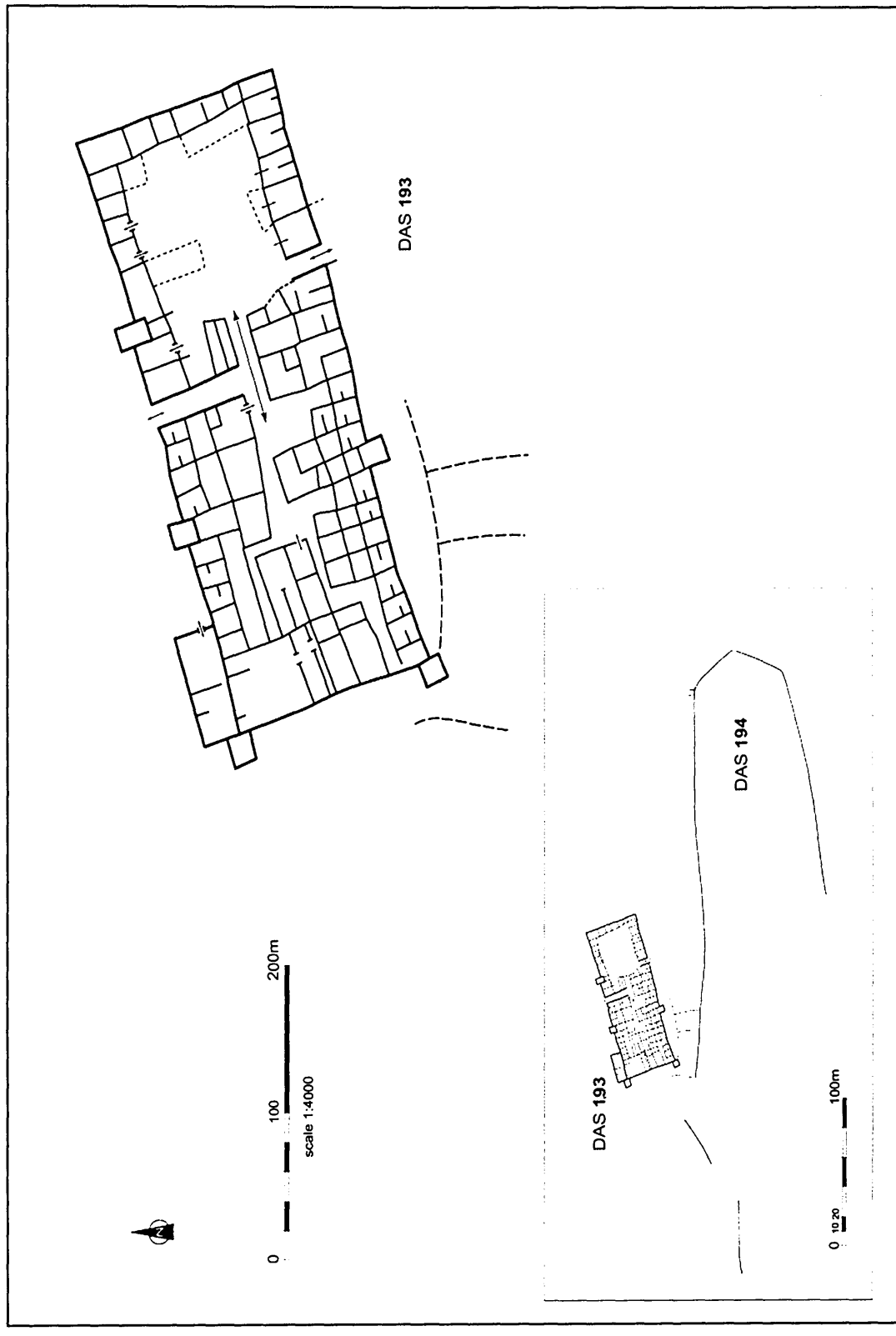



Figure 114 Plan DAS 193 Khirbat Qannas

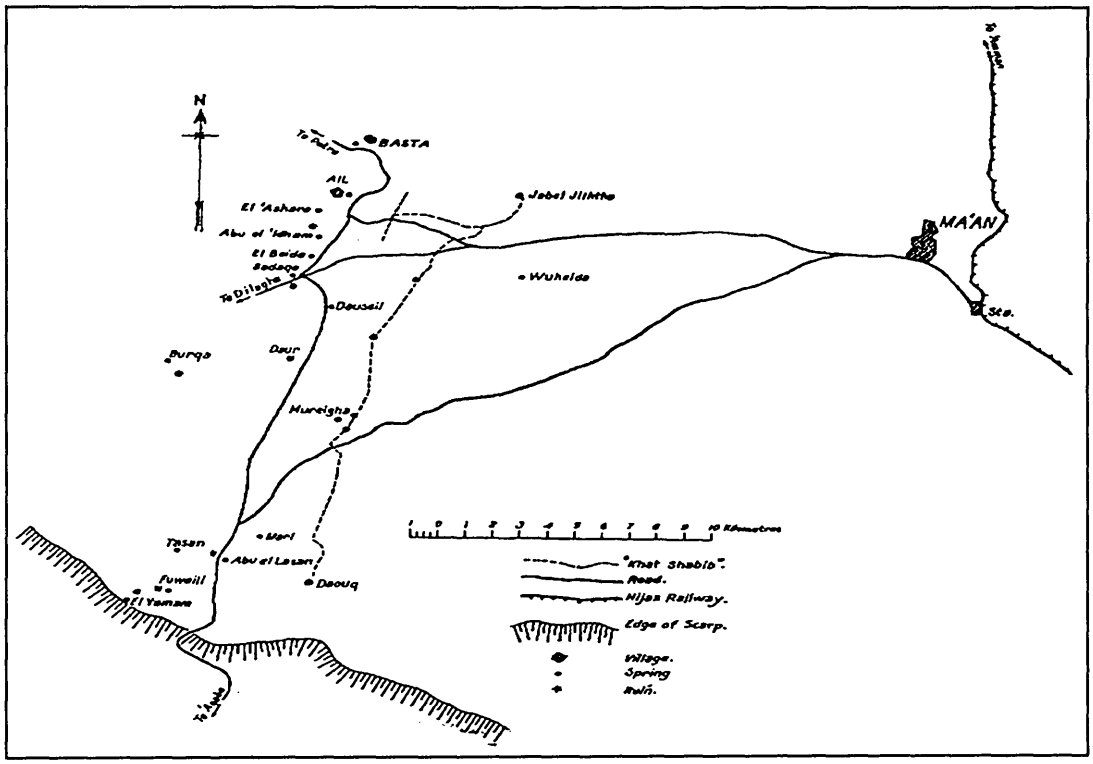



Figure 115 Kirkbride's map of Khatt Shabib. *From Kirkbride 1947/48, 152*

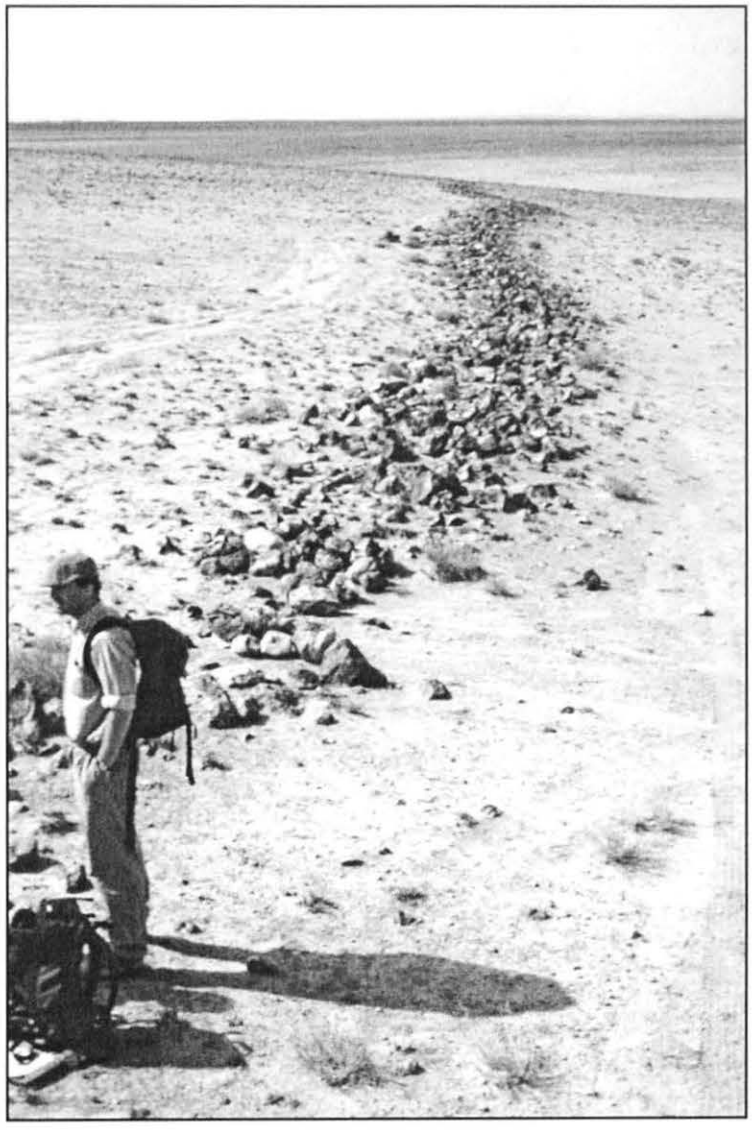


Figure 116 Photo DAS 198, 219 & 220 Khatt Shabib

| DAS Site No. | Site Type | Iron Age | Nabataean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Middle/Late Islamic |
|---|---|---|---|---|---|---|---|---|---|
| 231 | Tower | | X | X | X | X | X | X | |
| 230 | Tower | X | X | X | X | X | X | | |
| 238 | Tower | X | X | X | X | X | X | | |
| 228 | Enclosure | | | | | | | | |
| 227 | Enclosure | X | X | X | X | X | | | |
| 226 | Tower | | | | | | | | |
| 225 | Enclosure | | | | | | | | |
| 199 | Structure | | | | | | | | |
| 197 | Structure | | | | X | X | X | | |
| 193 | Fort | | X | X | X | X | X | X | X |
| 194 | Fields | | X | X | X | X | X | X | |
| 221 | Structure | | | | | | | | |
| 202 | Tower | X | X | X | X | X | X | X | |
| 222 | Tower | | X | X | X | X | X | | X |
| 223 | Tower | | | | | | | | |
| 205 | Tower | X | | | | X | X | X | X |
| 237 | Tower | | | X | X | X | | | |
| 203 | Tower | X | X | X | X | X | | | |
| 224 | Tomb | | | | X | X | | | |

Table 29 Sites associated with Khatt Shabib

| DAS Site No. | Name | Iron Age | Nabataean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Middle/Late Islamic |
|---|---|---|---|---|---|---|---|---|---|
| 231 | Qirana | X | X | X | X | X | X | X | |
| 230 | Bahash | X | X | X | X | X | X | | |
| 238 | Juheira | X | X | X | X | X | X | | |
| 226 | Tawil Ifjeij | X | X | X | | | | | X |
| 202 | | X | X | X | X | X | X | X | |
| 222 | | | X | X | X | X | X | | X |
| 223 | | | | | | | | | |
| 205 | | X | | | | X | X | X | X |
| 237 | | | | X | X | X | | | |
| 203 | | X | X | X | X | X | | | |

Table 30 Tower sites along Khatt Shabib

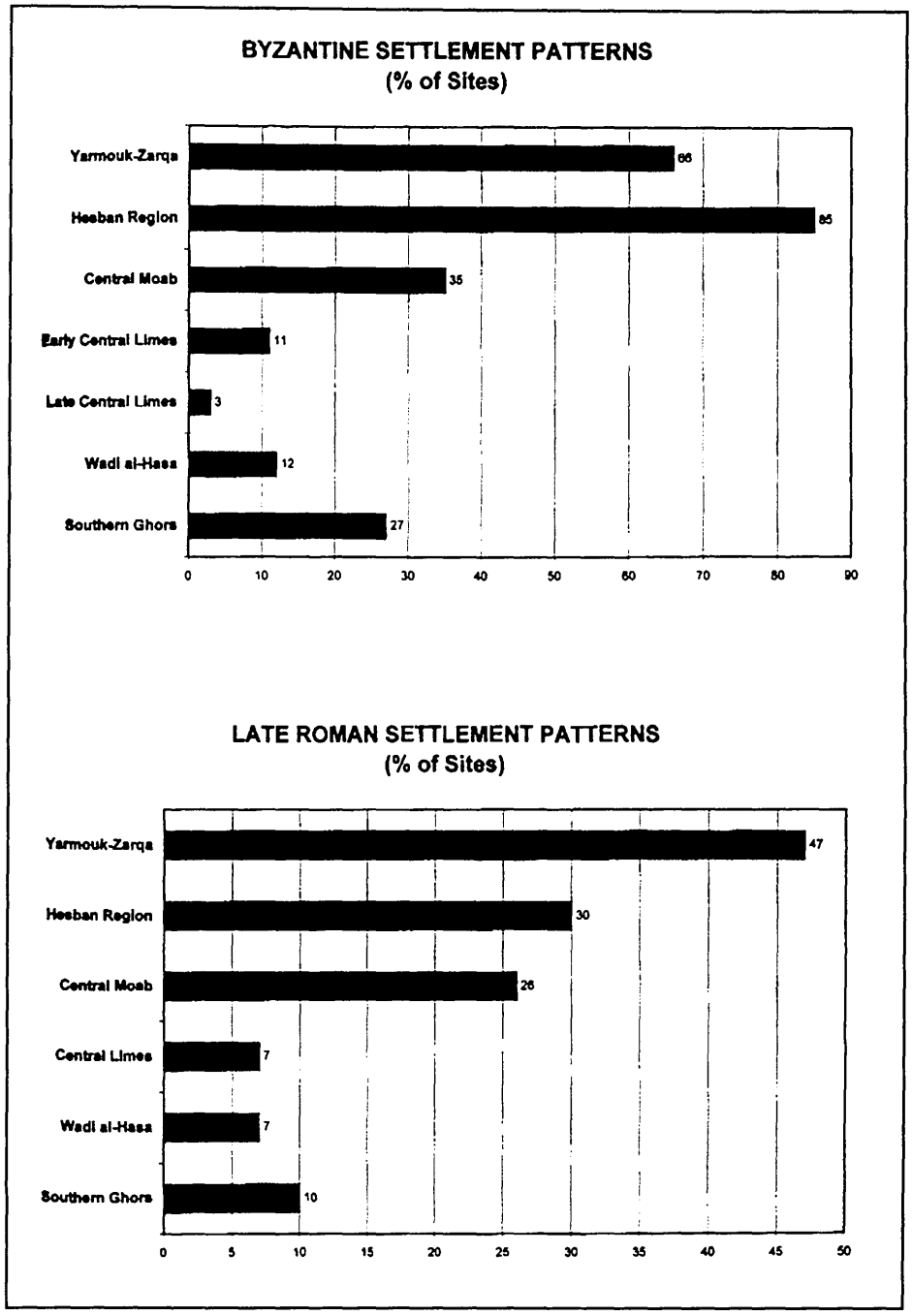



Figure 117 Roman & Byzantine settlment patterns in Jordan. *From Graf 2001, 221*

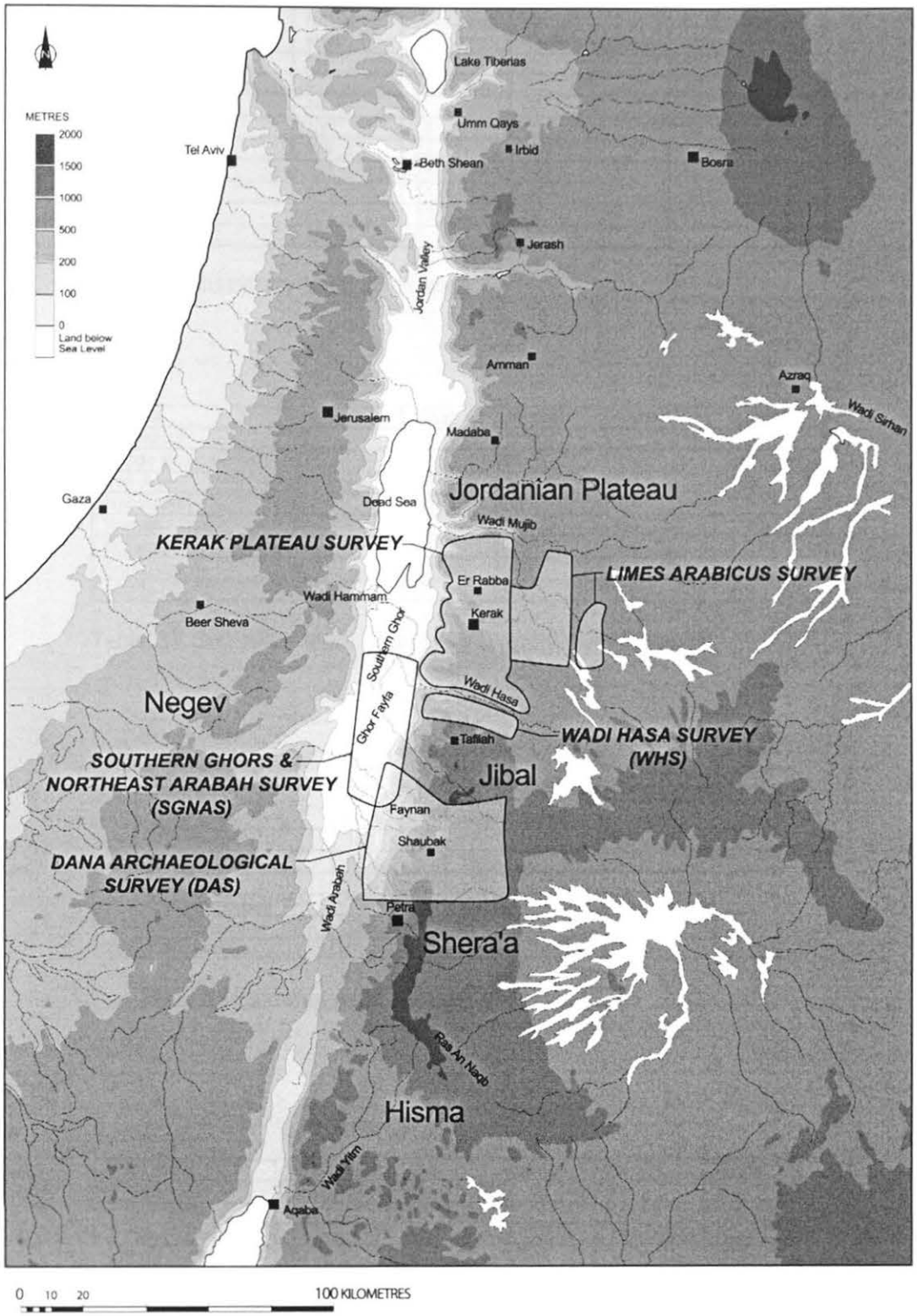



Figure 118 Location of all survey projects used in Chapter 7

| Period<br>Total area | No. of sites | % of sites | No. of continued sites | % of continued sites |
|---|---|---|---|---|
| Prehistoric | 20 | 3 | 2 | 10 |
| Middle Bronze Age | 4 | 1 | 3 | 75 |
| Iron Age | 46 | 6 | 35 | 76 |
| Nabataean | 136 | 18 | 131 | 96 |
| Roman | 170 | 23 | 153 | 90 |
| Byzantine | 169 | 23 | 72 | 43 |
| Early Islamic | 81 | 11 | 40 | 49 |
| Middle Islamic | 70 | 10 | 39 | 56 |
| Late Islamic | 40 | 5 | | |

Table 31 Summary table of all sites

| Period | Shaubak | Jibal | Arabah | Desert | Ma'an |
|---|---|---|---|---|---|
| Prehistoric | 22 | 0 | 0 | 0 | 0 |
| Middle Bronze Age | 100 | 0 | 0 | 0 | 0 |
| Iron Age | 72 | 85 | 50 | 100 | 0 |
| Nabataean | 97 | 100 | 83 | 83 | 0 |
| Roman | 91 | 85 | 71 | 62 | 80 |
| Byzantine | 42 | 41 | 43 | 40 | 71 |
| Early Islamic | 56 | 52 | 40 | 50 | 0 |
| Middle Islamic | 100 | 77 | 50 | 100 | 0 |

Table 32 Summary table of all sites on continuity by area

| Period<br>Total area | No. of sites | No. of continued sites | % of continued sites |
|---|---|---|---|
| Nabataean | 136 | 126 | 93 |
| Early Roman | 141 | 124 | 88 |
| Late Roman | 159 | 140 | 88 |
| Early Byzantine | 154 | 120 | 78 |
| Late Byzantine | 135 | 68 | 50 |
| Early Islamic | 81 | | |

Table 33 Summary of Classical sites

| All Sites | Shaubak | Jibal | Arabah | Desert | Ma'an |
|---|---|---|---|---|---|
| Nabataean | 92 | 98 | 67 | 83 | 0 |
| Early Roman | 88 | 87 | 86 | 100 | 100 |
| Late Roman | 90 | 90 | 71 | 71 | 80 |
| Early Byzantine | 70 | 82 | 100 | 100 | 100 |
| Late Byzantine | 56 | 45 | 40 | 38 | 71 |

Table 34 Summary of Classical sites on continuity by area

| Structural Types All sites | Total No. | % of Total No | Datable No. | % of Datable v Type |
|---|---|---|---|---|
| Single Structure | 88 | 37 | 57 | 65 |
| Tower | 41 | 17 | 34 | 83 |
| Farm | 30 | 13 | 28 | 93 |
| Settlement | 55 | 23 | 48 | 87 |
| State | 24 | 10 | 20 | 83 |

Table 35 DAS all sites by type and date

| Structural Types Regions | Structure | | Tower | | Farm | | Settlement | | State | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All | Dated | All | Dated | All | Dated | All | Dated | All | Dated |
| Shaubak | 41 | 34 | 14 | 13 | 18 | 16 | 25 | 22 | 8 | 7 |
| Jibal | 32 | 15 | 15 | 12 | 9 | 9 | 26 | 23 | 8 | 8 |
| Arabah | 8 | 2 | 8 | 6 | 0 | 0 | 4 | 3 | 4 | 2 |
| Desert | 2 | 2 | 4 | 3 | 0 | 0 | 0 | 0 | 4 | 3 |
| Ma'an | 5 | 4 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 |

Table 36 DAS structural sites by region

| All Sites | Structure (%) | Tower (%) | Farm (%) | Settlement (%) | State (%) |
|---|---|---|---|---|---|
| Nabataean | 87 | 100 | 87 | 94 | 94 |
| Early Roman | 80 | 96 | 85 | 94 | 82 |
| Late Roman | 89 | 90 | 91 | 89 | 87 |
| Early Byzantine | 78 | 86 | 75 | 86 | 80 |
| Late Byzantine | 46 | 34 | 37 | 74 | 43 |

Table 37 All datable structural sites on continuity

| Shaubak | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Nabataean | 92 | 100 | 87 | 88 | 100 |
| Early Roman | 83 | 89 | 92 | 94 | 71 |
| Late Roman | 92 | 90 | 86 | 89 | 80 |
| Early Byzantine | 73 | 82 | 69 | 75 | 67 |
| Late Byzantine | 48 | 50 | 44 | 78 | 25 |

Table 38 Shaubak datable structural sites on continuity

| Jibal | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Nabataean | 100 | 100 | 88 | 100 | 100 |
| Early Roman | 67 | 100 | 71 | 94 | 86 |
| Late Roman | 86 | 92 | 100 | 90 | 100 |
| Early Byzantine | 88 | 82 | 78 | 94 | 83 |
| Late Byzantine | 25 | 22 | 14 | 78 | 43 |

Table 39 Jibal datable structural sites on continuity

| Arabah | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Nabataean | 0 | 100 | * | 100 | 0 |
| Early Roman | 0 | 100 | * | 100 | 100 |
| Late Roman | 0 | 100 | * | 100 | 0 |
| Early Byzantine | 0 | 100 | * | 100 | 0 |
| Late Byzantine | 0 | 40 | * | 33 | 0 |

Table 40 Arabah datable structural sites on continuity

| Desert | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Nabataean | 0 | 100 | * | * | 50 |
| Early Roman | 100 | 100 | * | * | 100 |
| Late Roman | 0 | 67 | * | * | 100 |
| Early Byzantine | 0 | 100 | * | * | 100 |
| Late Byzantine | 0 | 0 | * | * | 67 |

Table 41 Desert datable structural sites on continuity

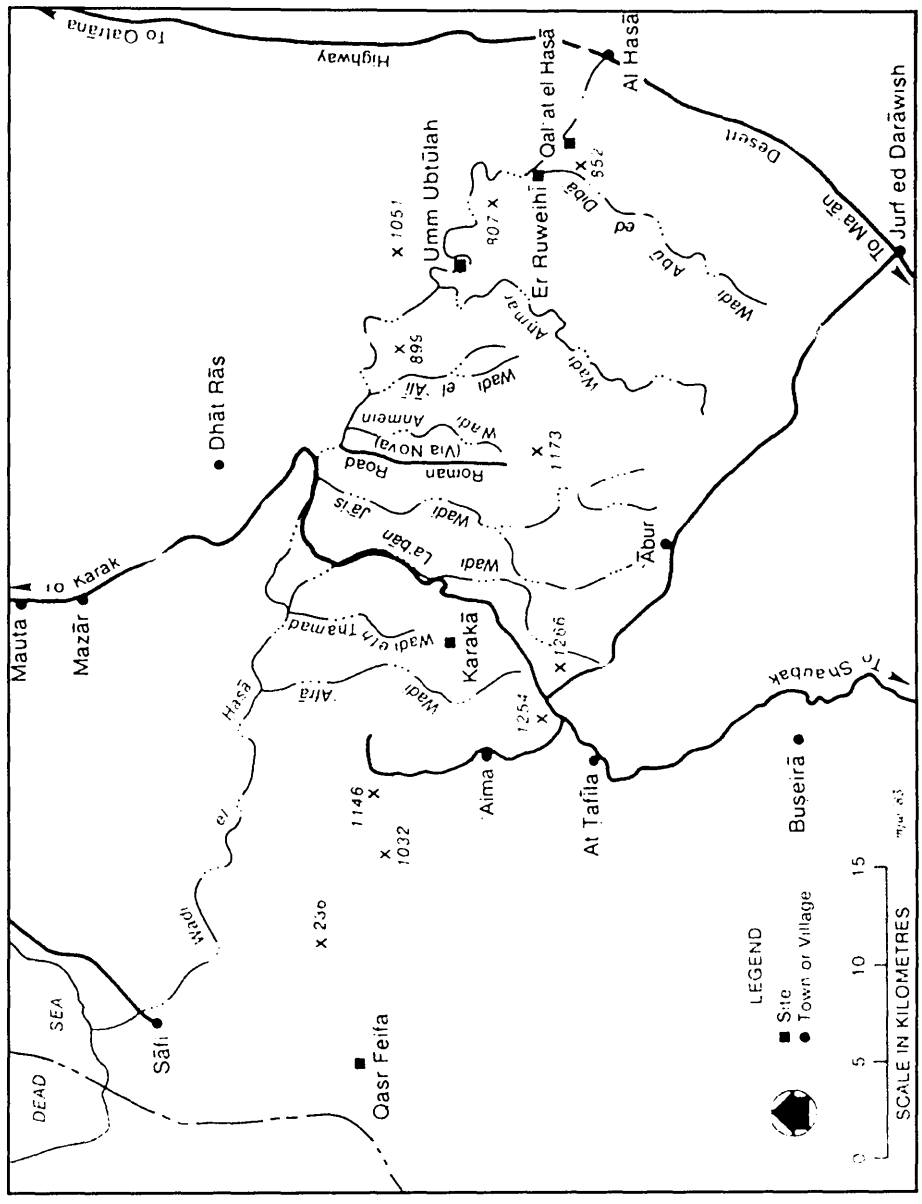



Figure 119 Map WHS project universe. *From MacDonald 1988, 3 Fig. 1*

| Period<br>All sites | No. of sites | % sites | Continued sites | % Continued sites |
|---|---|---|---|---|
| Prehistoric | 68 | 7 | 2 | 3 |
| Middle Bronze Age | 2 | 0.2 | 2 | 100 |
| Late Bronze Age | 8 | 0.8 | 7 | 88 |
| Iron Age | 72 | 7.5 | 47 | 65 |
| Nabataean | 208 | 21.5 | 55 | 26 |
| Roman | 135 | 14 | 22 | 16 |
| Byzantine | 126 | 13 | 7 | 6 |
| Early Islamic | 11 | 1 | 4 | 36 |
| Middle Islamic | 81 | 8 | 75 | 92 |
| Late Islamic | 264 | 27 | | |

Table 42 WHS all sites

| Period<br>Structural | No. of sites | % sites | Continued sites | % Continued sites |
|---|---|---|---|---|
| Prehistoric | 36 | 7.5 | 1 | 3 |
| Middle Bronze Age | 1 | 0.2 | 1 | 100 |
| Late Bronze Age | 4 | 0.8 | 4 | 100 |
| Iron Age | 55 | 11.5 | 36 | 66 |
| Nabataean | 100 | 21 | 31 | 31 |
| Roman | 46 | 10 | 18 | 39 |
| Byzantine | 69 | 14 | 3 | 4 |
| Early Islamic | 4 | 1 | 3 | 75 |
| Middle Islamic | 43 | 9 | 39 | 91 |
| Late Islamic | 118 | 25 | | |

Table 43 WHS structural sites

| Period<br>Structural | No. of sites | % sites | Continued sites | % Continued sites |
|---|---|---|---|---|
| Prehistoric | 36 | 7.5 | 1 | 3 |
| Middle Bronze Age | 1 | 0.2 | 1 | 100 |
| Late Bronze Age | 4 | 0.8 | 4 | 100 |
| Iron Age | 55 | 11.5 | 36 | 66 |
| Nabataean | 100 | 21 | 31 | 31 |
| Roman | 46 | 10 | 18 | 39 |
| Byzantine | 69 | 14 | 3 | 4 |
| Early Islamic | 4 | 1 | 3 | 75 |
| Middle Islamic | 43 | 9 | 39 | 91 |
| Late Islamic | 118 | 25 | | |

Table 44 WHS structural sites by type

| WHS | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Prehistoric | 0 | 0 | 0 | 6 | 0 |
| Middle Bronze | 0 | 0 | 0 | 100 | 0 |
| Late Bronze | 0 | 0 | 100 | 100 | 0 |
| Iron Age | 100 | 25 | 60 | 78 | 40 |
| Nabataean | 21 | 22 | 18 | 40 | 43 |
| Roman | 14 | 25 | 22 | 67 | 25 |
| Byzantine | 0 | 0 | 0 | 9 | 0 |
| Early Islamic | 0 | 0 | 0 | 75 | 0 |
| Middle Islamic | 100 | 100 | 100 | 82 | 100 |

Table 45 WHS structural types by continuity

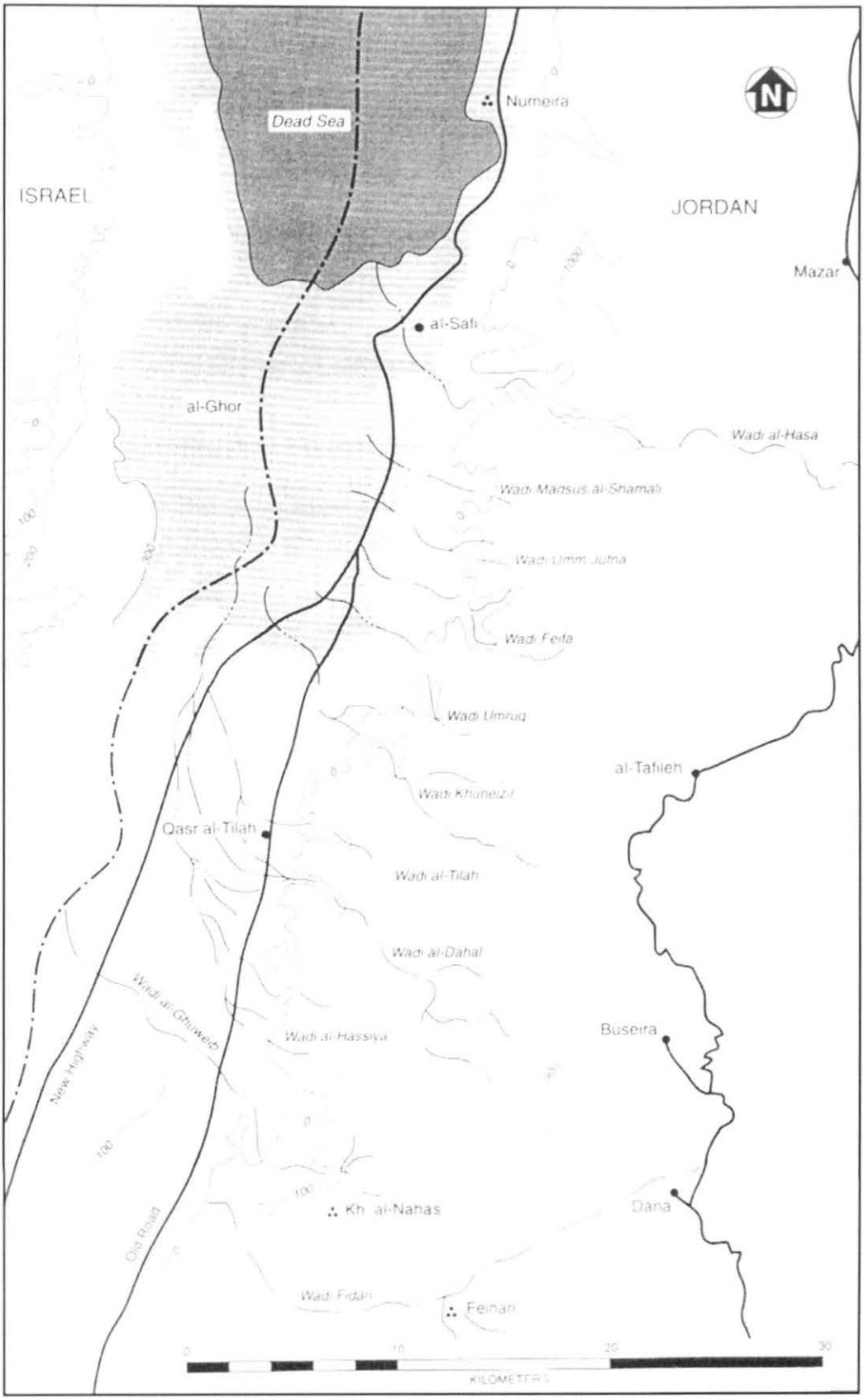



Figure 120 Map SGNAS project universe. *From MacDonald 1992, 2 Fig. 1*

| Period All sites | No. of sites | % of sites | Continuity sites | % Continuity |
|---|---|---|---|---|
| Prehistoric | 68 | 24 | 15 | 22 |
| Iron Age | 47 | 16.5 | 9 | 19 |
| Nabataean | 32 | 11 | 14 | 44 |
| Roman | 30 | 10.5 | 14 | 47 |
| Byzantine | 63 | 22 | 11 | 18 |
| Early Islamic | 21 | 7.5 | 18 | 86 |
| Middle Islamic | 24 | 8.5 | | |

Table 46 SGNAS all sites

| Period Structures | No. of sites | % of sites | Continuity sites | % Continuity |
|---|---|---|---|---|
| Prehistoric | 11 | 15 | 3 | 27 |
| Iron Age | 7 | 10 | 2 | 28 |
| Nabataean | 10 | 14 | 7 | 70 |
| Roman | 10 | 14 | 6 | 60 |
| Byzantine | 18 | 25 | 4 | 22 |
| Early Islamic | 8 | 11 | 6 | 75 |
| Middle Islamic | 8 | 11 | | |

Table 47 SGNAS structural sites

| Structural Types | Total No. | % of Total No. | Datable No. | % Datable No. |
|---|---|---|---|---|
| State<br>Caravanserai 1<br>Fort 2<br>Fortress 1 | 4 | 14 | 4 | 100 |
| Farm | 3 | 11 | 3 | 100 |
| Mill | 2 | * | * | * |
| Structure | 9 | 32 | 7 | 78 |
| Temple | 2 | * | * | * |
| Tower | 4 | 14 | 4 | 100 |
| Settlement | 8 | 29 | 7 | 88 |

Table 48 SGNAS structural sites by type

| SGNAS | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Prehistoric | 25 | 100 | 0 | 0 | 50 |
| Iron Age | 0 | 100 | 0 | 0 | 50 |
| Nabataean | 0 | 100 | 0 | 100 | 100 |
| Roman | 100 | 50 | 0 | 50 | 50 |
| Byzantine | 60 | 50 | 0 | 0 | 50 |
| Early Islamic | 100 | 67 | 100 | 0 | 50 |
| Middle Islamic | * | * | * | * | * |

Table 49 SGNAS structural type sites by continuity

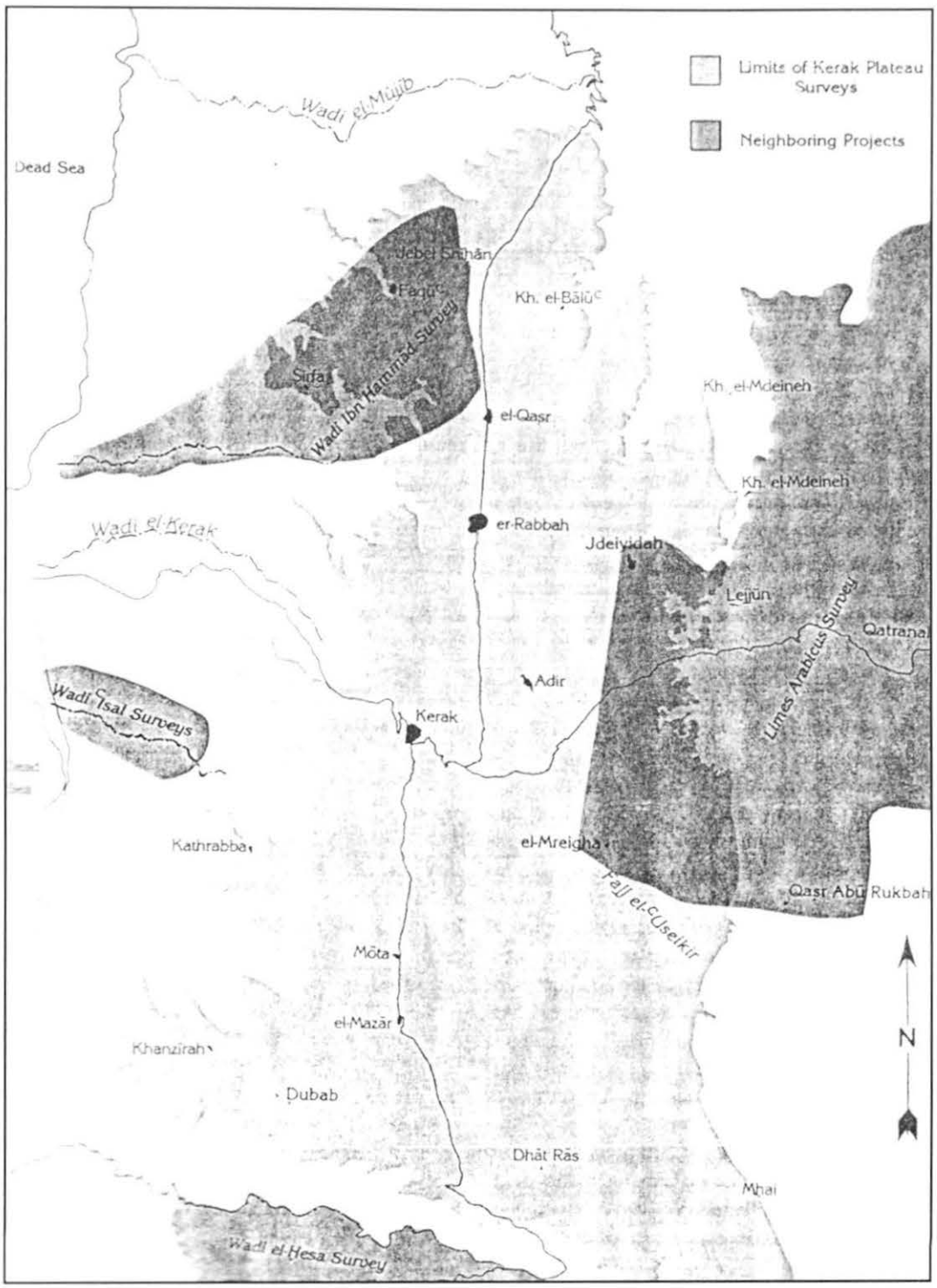



Figure 121 Map Kerak Plateau Survey universe. *From Miller 1991, 21 Fig 3*

| Period All sites | No. of sites | % of sites | Continuity sites | % Continuity |
|---|---|---|---|---|
| Prehistoric | 85 | 6 | 30 | 35 |
| Middle Bronze Age | 54 | 4 | 38 | 70 |
| Late Bronze Age | 109 | 7.5 | 73 | 67 |
| Iron Age | 168 | 11 | 148 | 88 |
| Nabataean | 308 | 21 | 112 | 36 |
| Roman | 115 | 8 | 97 | 84 |
| Byzantine | 212 | 14.5 | 58 | 27 |
| Early Islamic | 61 | 4 | 60 | 98 |
| Middle Islamic | 238 | 16 | 108 | 45 |
| Late Islamic | 115 | 8 | | |

Table 50 Kerak all sites

| Period Structural | No. of sites | % of sites | Continuity sites | % Continuity |
|---|---|---|---|---|
| Prehistoric | 75 | 6 | 28 | 37 |
| Middle Bronze Age | 50 | 4 | 35 | 70 |
| Late Bronze Age | 100 | 8 | 70 | 70 |
| Iron Age | 155 | 12 | 135 | 87 |
| Nabataean | 255 | 20 | 105 | 41 |
| Roman | 108 | 8 | 90 | 83 |
| Byzantine | 191 | 15 | 58 | 30 |
| Early Islamic | 61 | 4 | 60 | 98 |
| Middle Islamic | 215 | 16 | 92 | 43 |
| Late Islamic | 96 | 7 | | |

Table 51 Kerak structural sites

| Structural Types | Total No. | % of Total No | Datable No. | % Datable No. |
|---|---|---|---|---|
| State Caravanserai 2 Fort 11 Fortress 2 | 15 | 5 | 13 | 87 |
| Farm | 12 | 4 | 11 | 92 |
| Structure | 123 | 38 | 103 | 84 |
| Mill | 3 | * | * | * |
| Temple | 8 | * | * | * |
| Tower | 38 | 12 | 31 | 82 |
| Settlement | 131 | 41 | 130 | 99 |

Table 52 Kerak structural sites by type

| Kerak | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Prehistoric | 20 | 33 | 0 | 49 | 25 |
| Middle Bronze | 64 | 100 | 0 | 72 | 75 |
| Late Bronze | 62 | 57 | 67 | 74 | 83 |
| Iron Age | 82 | 73 | 75 | 95 | 70 |
| Nabataean | 31 | 46 | 25 | 51 | 22 |
| Roman | 69 | 62 | 50 | 95 | 67 |
| Byzantine | 8 | 0 | 0 | 44 | 50 |
| Early Islamic | 100 | 0 | 0 | 98 | 100 |
| Middle Islamic | 61 | 62 | 71 | 31 | 30 |

Table 53 Kerak structural types by continuity

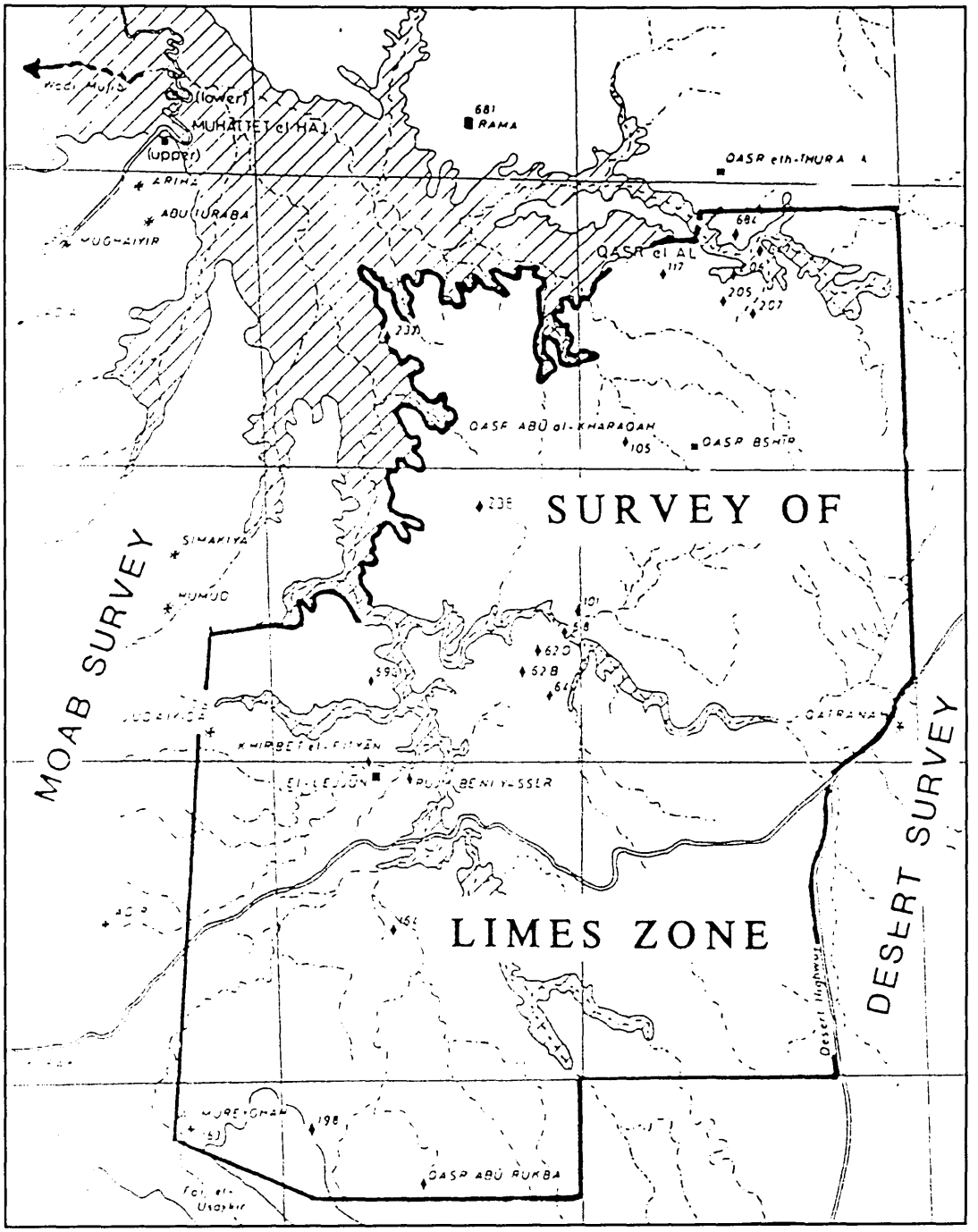



Figure 122 Map Limes Arabicus project Kerak universe. *From Parker 1987a, 43 Fig. 18*

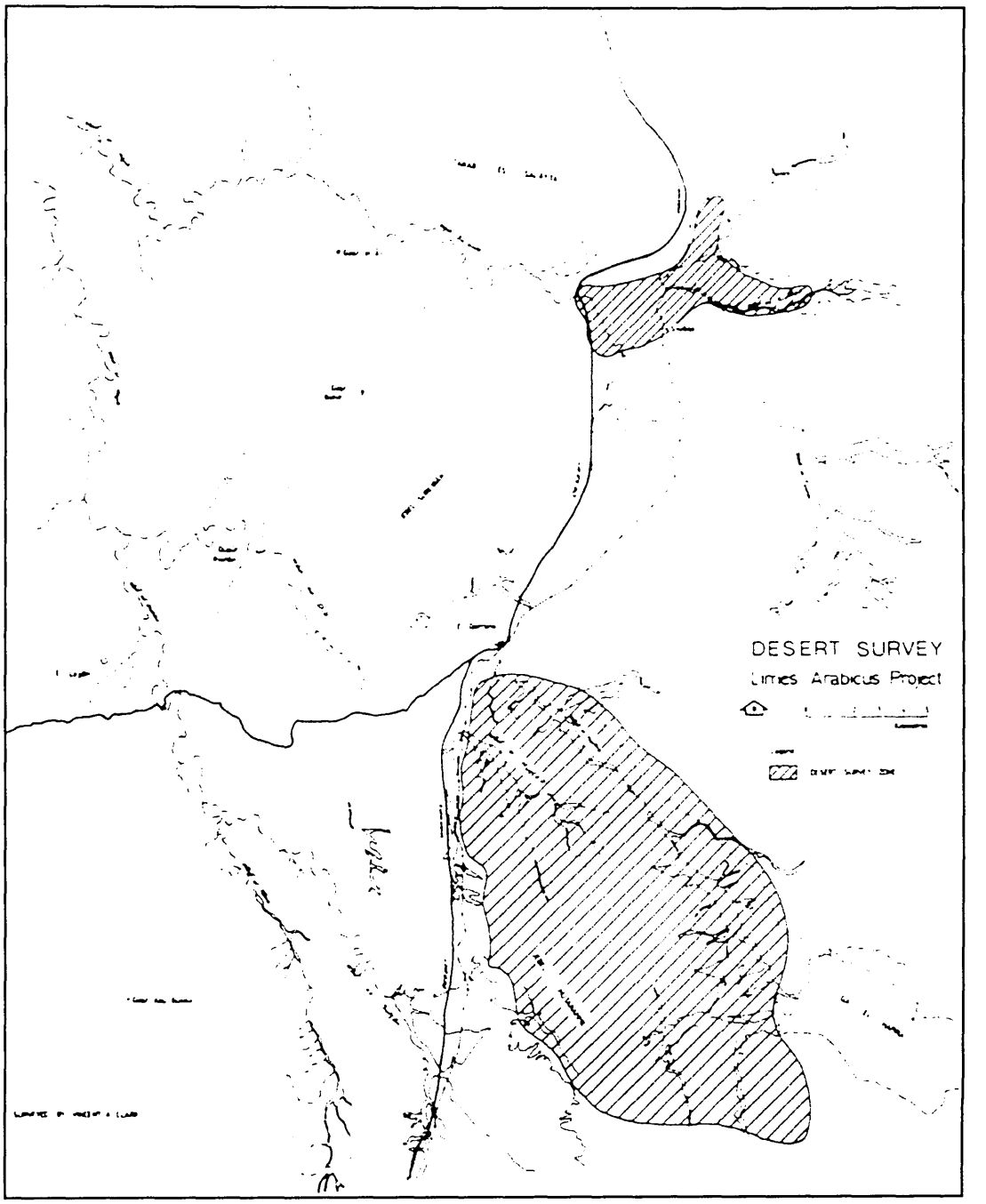



Figure 123 Map Limes Arabicus project Desert universe. *From Parker 1987a, 108 Fig. 34*

| Period All sites | No. of sites | % of sites | Continuity sites | % of continuity |
|---|---|---|---|---|
| Prehistoric | 190 | 21.5 | 63 | 33 |
| Iron Age | 139 | 16 | 109 | 78 |
| Nabataean | 268 | 30.5 | 43 | 20 |
| Roman | 64 | 7 | 51 | 80 |
| Byzantine | 122 | 14 | 24 | 20 |
| Umayyad | 32 | 4 | 5 | 16 |
| Mamluke | 11 | 1 | 2 | 18 |
| Ottoman | 54 | 6 | | |

Table 54 Limes all sites

| Period Structures | No. of sites | % of sites | Continuity sites | % of continuity |
|---|---|---|---|---|
| Prehistoric | 49 | 14.5 | 12 | 24 |
| Iron Age | 60 | 17.5 | 48 | 80 |
| Nabataean | 103 | 30.5 | 26 | 25 |
| Roman | 29 | 8.5 | 27 | 93 |
| Byzantine | 55 | 16 | 12 | 22 |
| Umayyad | 16 | 5 | 2 | 12 |
| Mamluke | 6 | 2 | 1 | 17 |
| Ottoman | 21 | 6 | | |

Table 55 Limes structural sites

| Structural Types | Total No. | % of Total No. | Datable No. | % Datable no v Type |
|---|---|---|---|---|
| State (Fort) | 10 | 7 | 10 | 100 |
| Farm | 1 | 10 | 1 | 100 |
| Structure | 56 | 40 | 46 | 82 |
| Tower | 66 | 47 | 63 | 95 |
| Settlement | 7 | 5 | 7 | 100 |

Table 56 Limes structural sites by type

| Limes | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| Prehistoric | 28 | 50 | 0 | 50 | 50 |
| Iron Age | 88 | 72 | 0 | 80 | 100 |
| Nabataean | 14 | 22 | 0 | 50 | 86 |
| Roman | 100 | 93 | 0 | 100 | 83 |
| Byzantine | 20 | 18 | 100 | 75 | 17 |
| Early Islamic | 0 | 28 | 0 | 0 | 0 |
| Middle Islamic | 0 | 0 | 0 | 100 | 100 |

Table 57 Limes structural types by continuity

| All sites | DAS | WHS | SGNAS | Kerak | Limes |
|---|---|---|---|---|---|
| Iron Age | 76 | 66 | 28 | 87 | 80 |
| Nabataean | 96 | 31 | 70 | 41 | 25 |
| Roman | 90 | 39 | 60 | 83 | 93 |
| Byzantine | 43 | 4 | 22 | 30 | 22 |
| Early Islamic | 49 | 75 | 75 | 98 | 12 |
| Middle Islamic | 56 | 91 | * | 43 | 17 |

Table 58 All surveys all sites by continuity

| Projects | Structure % | Tower % | Farm % | Settlement % | State % |
|---|---|---|---|---|---|
| DAS | 37 | 17 | 13 | 23 | 10 |
| WHS | 21 | 18 | 28 | 27 | 6 |
| SGNAS | 32 | 14 | 11 | 29 | 14 |
| Kerak | 38 | 12 | 4 | 41 | 5 |
| Limes | 40 | 47 | 1 | 5 | 7 |

Table 59 All surveys all sites by type ratio

| Structure | DAS | WHS | SGNAS | Kerak | Limes |
|---|---|---|---|---|---|
| Iron Age | 63 | 100 | 0 | 82 | 88 |
| Nabataean | 91 | 21 | 0 | 31 | 14 |
| Roman | 81 | 14 | 100 | 69 | 100 |
| Byzantine | 36 | 0 | 60 | 8 | 20 |
| Early Islamic | 47 | 0 | 100 | 100 | 0 |
| Middle Islamic | 54 | 100 | * | 61 | 0 |

Table 60 All surveys Structure by continuity

| Tower | DAS | WHS | SGNAS | Kerak | Limes |
|---|---|---|---|---|---|
| Iron Age | 70 | 25 | 100 | 73 | 72 |
| Nabataean | 100 | 22 | 100 | 46 | 22 |
| Roman | 90 | 25 | 50 | 62 | 93 |
| Byzantine | 33 | 0 | 50 | 0 | 18 |
| Early Islamic | 30 | 0 | 67 | 0 | 28 |
| Middle Islamic | 83 | 100 | * | 62 | 0 |

Table 61 All surveys Tower by continuity

| Farm | DAS | WHS | SGNAS | Kerak | Limes |
|---|---|---|---|---|---|
| Iron Age | 100 | 60 | 0 | 75 | 0 |
| Nabataean | 92 | 18 | 0 | 25 | 0 |
| Roman | 92 | 22 | 0 | 50 | 0 |
| Byzantine | 36 | 0 | 0 | 0 | 100 |
| Early Islamic | 33 | 0 | 100 | 0 | 0 |
| Middle Islamic | 28 | 100 | * | 71 | 0 |

Table 62 All surveys Farm by continuity

| Settlement | DAS | WHS | SGNAS | Kerak | Limes |
|---|---|---|---|---|---|
| Iron Age | 85 | 78 | 0 | 95 | 80 |
| Nabataean | 97 | 40 | 100 | 51 | 50 |
| Roman | 95 | 67 | 50 | 95 | 100 |
| Byzantine | 68 | 9 | 0 | 44 | 75 |
| Early Islamic | 62 | 75 | 0 | 98 | 0 |
| Middle Islamic | 57 | 82 | * | 31 | 100 |

Table 63 All surveys Settlement by continuity

| State | DAS | WHS | SGNAS | Kerak | Limes |
|---|---|---|---|---|---|
| Iron Age | 100 | 40 | 50 | 70 | 100 |
| Nabataean | 100 | 43 | 100 | 22 | 86 |
| Roman | 94 | 25 | 50 | 67 | 83 |
| Byzantine | 38 | 0 | 50 | 50 | 17 |
| Early Islamic | 67 | 0 | 50 | 100 | 0 |
| Middle Islamic | 100 | 100 | * | 30 | 100 |

Table 64 All surveys State by continuity

| Name | Location | Date | Source | Publication |
|---|---|---|---|---|
| ? | Jamnia, Phasaelis & Archelais<br>Livia's estates from Salome passing to Tiberius and Gaius | 1st Century AD | Josephus Ant. 18.31 | Crawford 1976, 63 |
| ? | horti regii producing balsam | 1st Century AD | Pliny NH 111-13 | Crawford 1976, 63 |
| ? | Sharon Plain and Samaria | Hellenistic-Roman | | Applebaum 1989, 97-110 |
| ? | Date Grove Moaza Nabataean King | 99 AD | P. Yadin 2 & 3 | Cotton 1997, 257 |
| ? | Ein Gedi | 124 AD | P. Yadin 11, 1, 13 | Lewis 1989, 42-43 |
| ? | Date grove Moaza | 127 AD | P. Yadin 16, 24, 34 | Lewis 1989, 66-67 |
| Θαιμαν/ Theman Χώμη/ villa | east/north of petra Jibal | *c.* 293 AD | Eusebius 96, 18-23 Jerome 97, 14-19 | Klostermann 1904 |
| Σαλτων? | ? | *c.* 520–540 AD | Beersheva Edict Ins.1, Frag. VI | See Chapter 3 |
| Σαλτον | ? | *c.* 520–540 AD | Beersheva Edict Ins. 4, Frag. II, III, IV | See Chapter 3 |
| Σαλτων Κωνσταντιανιχης | Khirbat Al Ma'in | *c.* 520–540 AD | Beersheva Edict Ins. 4, Frag. II, III, IV | See Chapter 3 |
| ?οριου Ἀρινδήλων | ?in territory of Gharandal | *c.* 520–540 AD | Beersheva Edict Ins. 4, Frag. II, III, IV | See Chapter 3 |
| ?οριου Πετρων | ?in territory of Petra | *c.* 520–540 AD | Beersheva Edict Ins. 4, Frag. II, III, IV | See Chapter 3 |
| Τερεβινθος | Haram Ramat Al-Halil | *c.* 520–540 AD | Beersheva Edict Ins. 4, Frag. II, III, IV | See Chapter 3 |
| Saltus Gerariticus | Khirbat Al Far | *c.* 550 AD | Madaba Map | Donner 1992 |
| ? | Imperial lands between Petra and Udruh | Middle 6th Century AD | Petra Papyri | Koenen 1996, 178-179 |
| Σαλτων ἱερατιχου | North of Petra Jibal | Before *c.* 533 AD | George of Cyprus | Honigman 1939, 43-44 |

Table 65 List of imperial estates in Palestine/Arabia

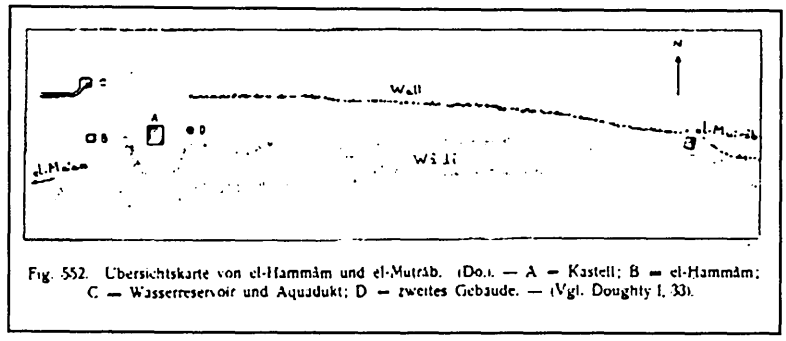



Fig. 552. Übersichtskarte von el-Hammâm und el-Muṭrâb. (Do.) — A = Kastell; B = el-Hammâm; C = Wasserreservoir und Aquädukt; D = zweites Gebäude. — (Vgl. Doughty I, 33).

Figure 124 Brünnow & von Domaszewski's sketch of Ma'an sites. *From Brünnow & von Domaszewski 1905 4, Fig. 552*

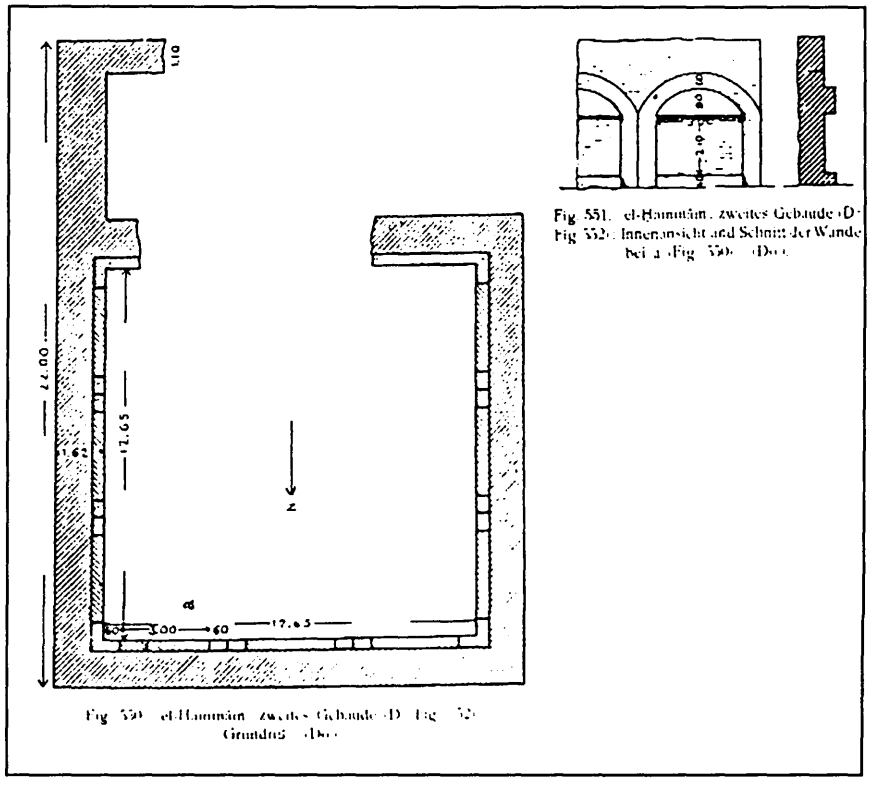



Figure 125 Brünnow & von Domaszewski's plan Building D. *From Brünnow & von Domaszewski 1905 3, Figs. 550, 551, 552*

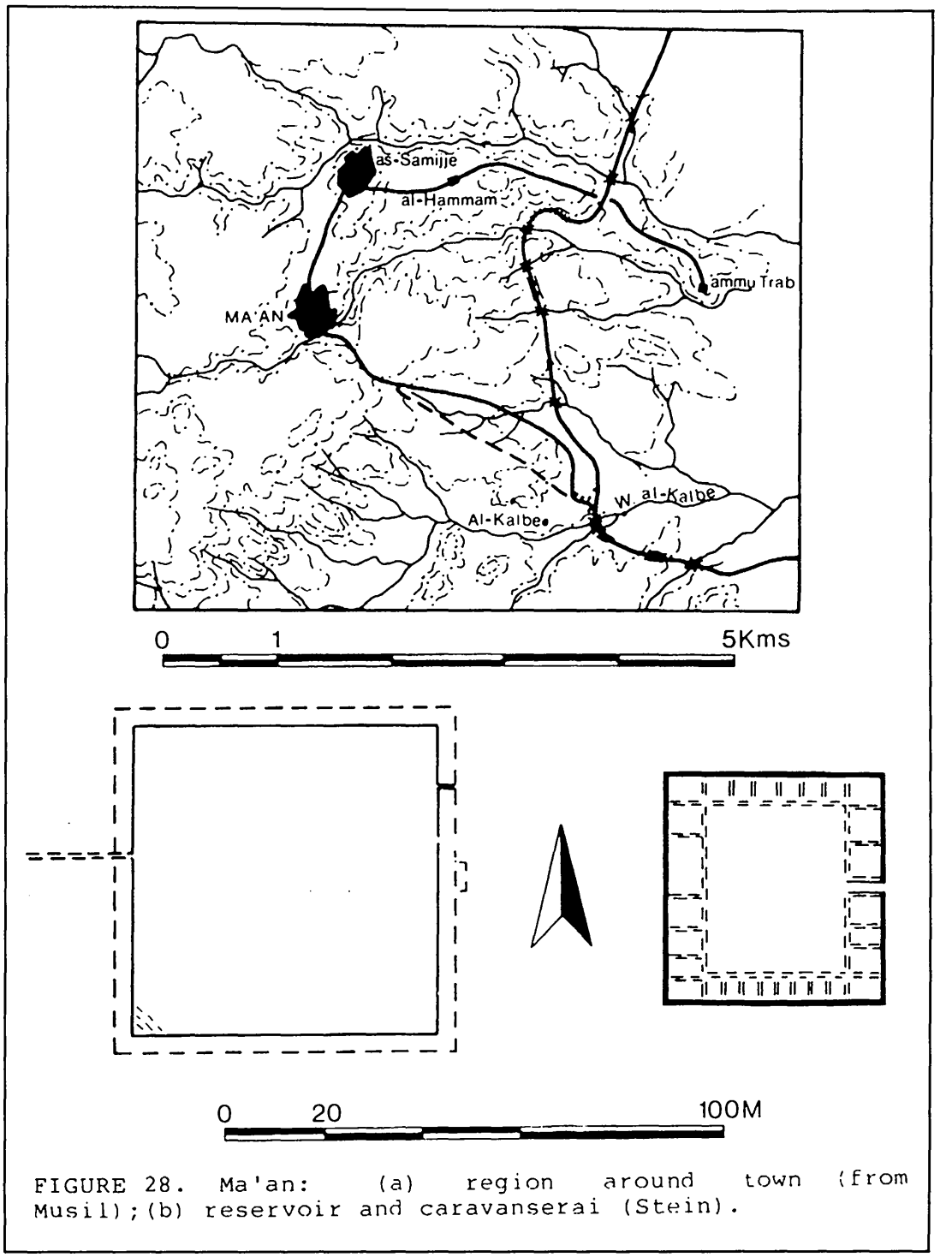



FIGURE 28. Ma'an: (a) region around town (from Musil); (b) reservoir and caravanserai (Stein).

Figure 126 Stein's map of Ma'an and environs with plan of Hammam.
*From Gregory & Kennedy 1985, 297 fig. 28*

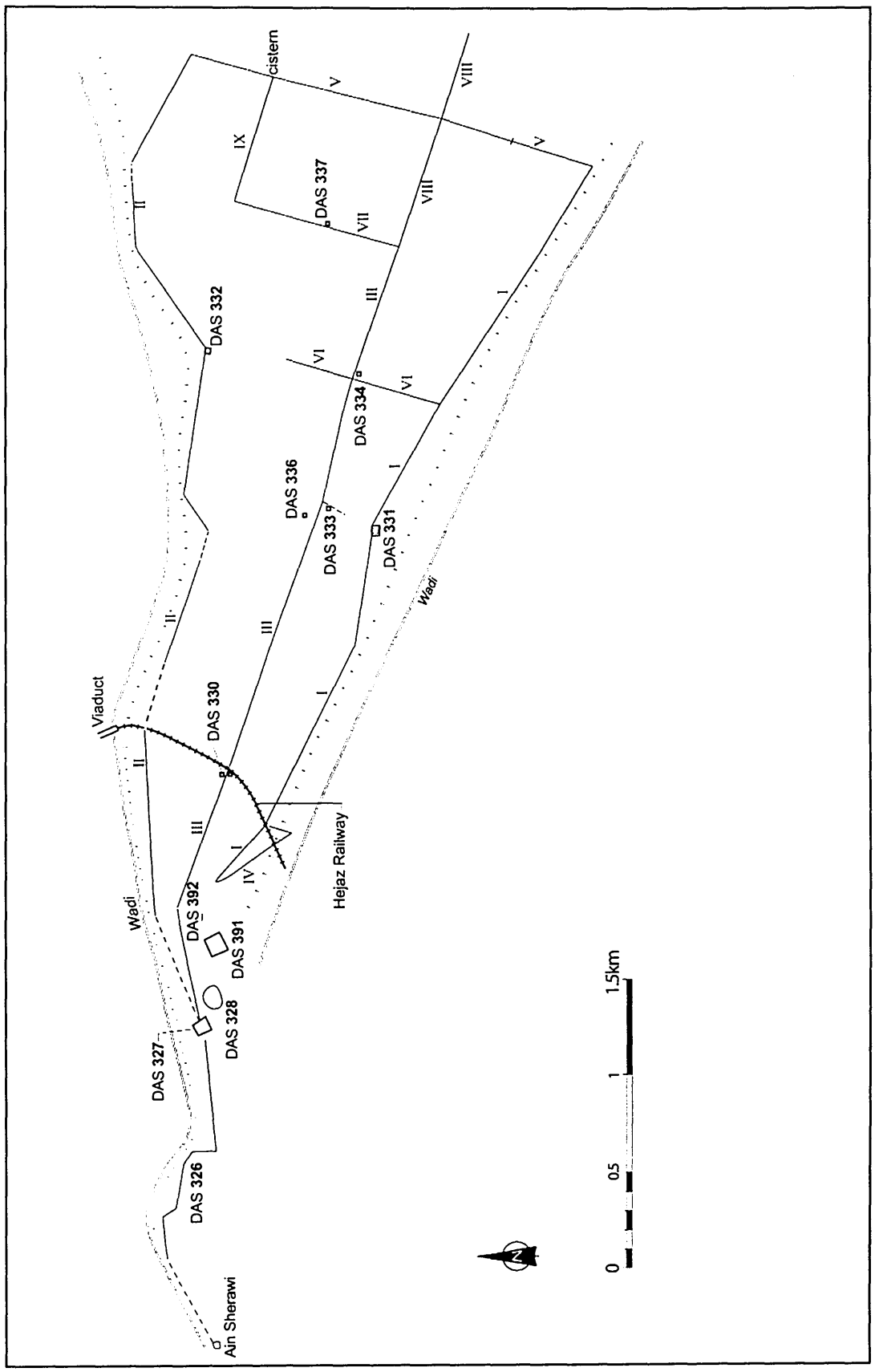



Figure 127 Plan of Unit DAS 335

| DAS Site No. | Prehistoric | IA | Nabataean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Modern |
|---|---|---|---|---|---|---|---|---|---|
| 326 | | | | X | X | | | | |
| 328 | | | | | X | X | X | X | |
| 330 | | | | | | | | X | X |
| 331 | | | | | X | X | X | | |
| 332 | | | | | | | X | X | |
| 333 | X | | | | X | X | X | X | |
| 334 | | | | | | X | X | | |
| 391 | X | | | | X | X | X | X | |
| 392 | | | | | | | X | X | |

Table 66 DAS Ma'an Estate

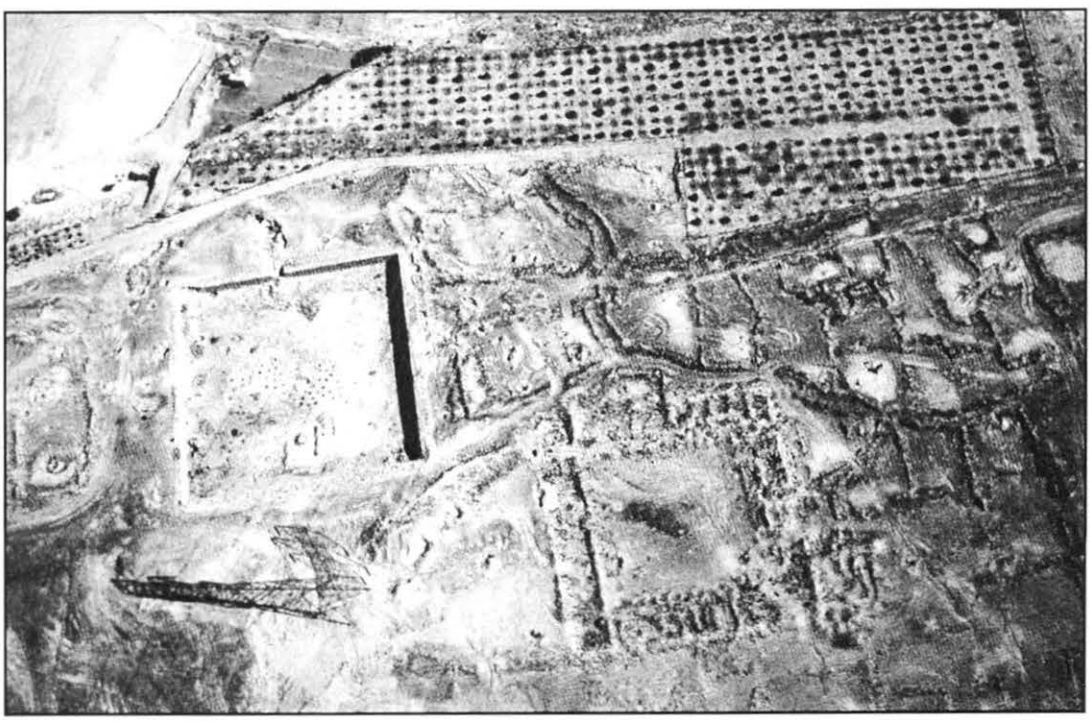


Figure 128 Photo of Hammam and reservoir. *From Kennedy 2000, 175 Fig. 18.2*

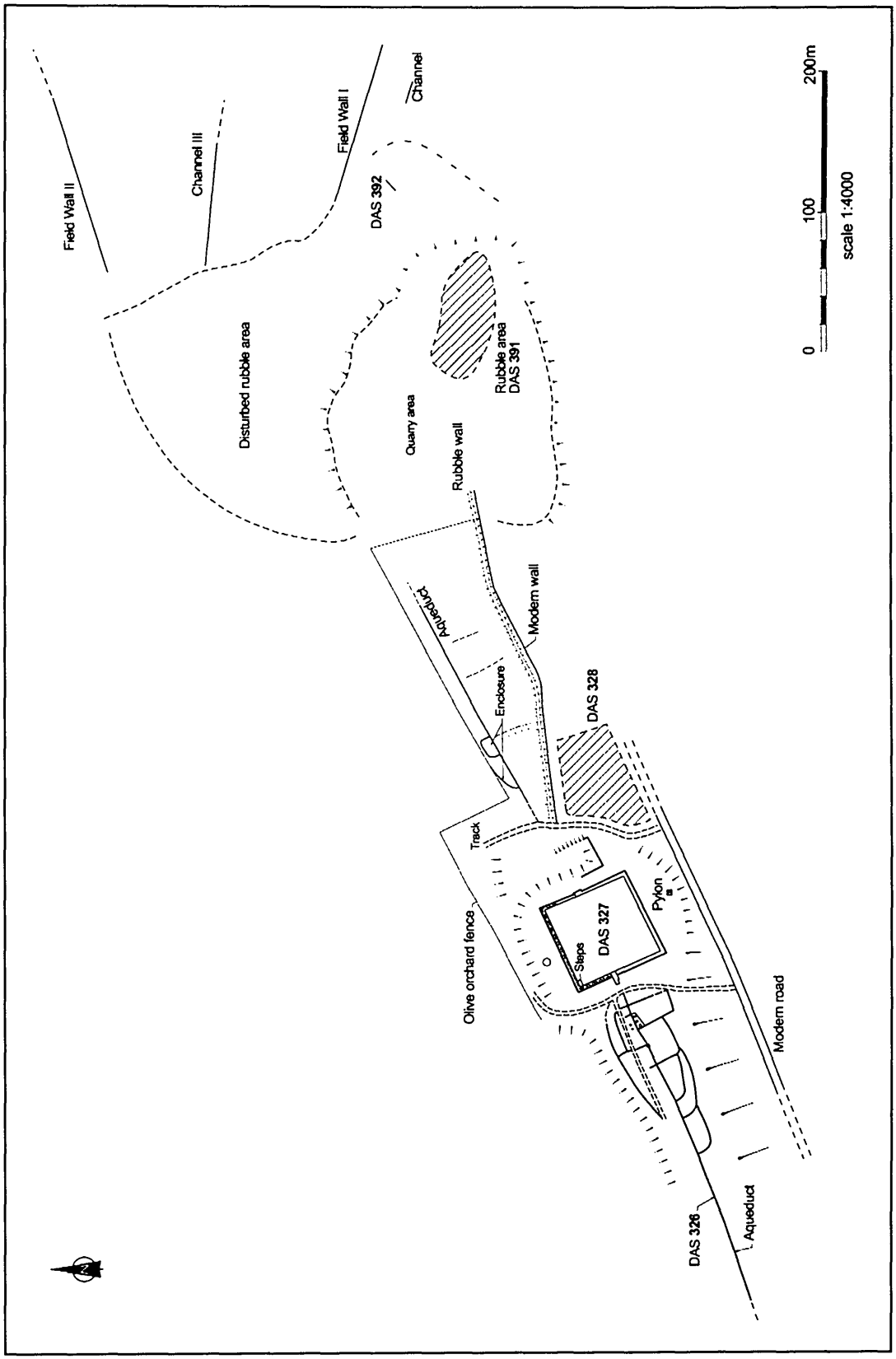



Figure 129 Detailed Plan of Reservoir DAS 327 and environs

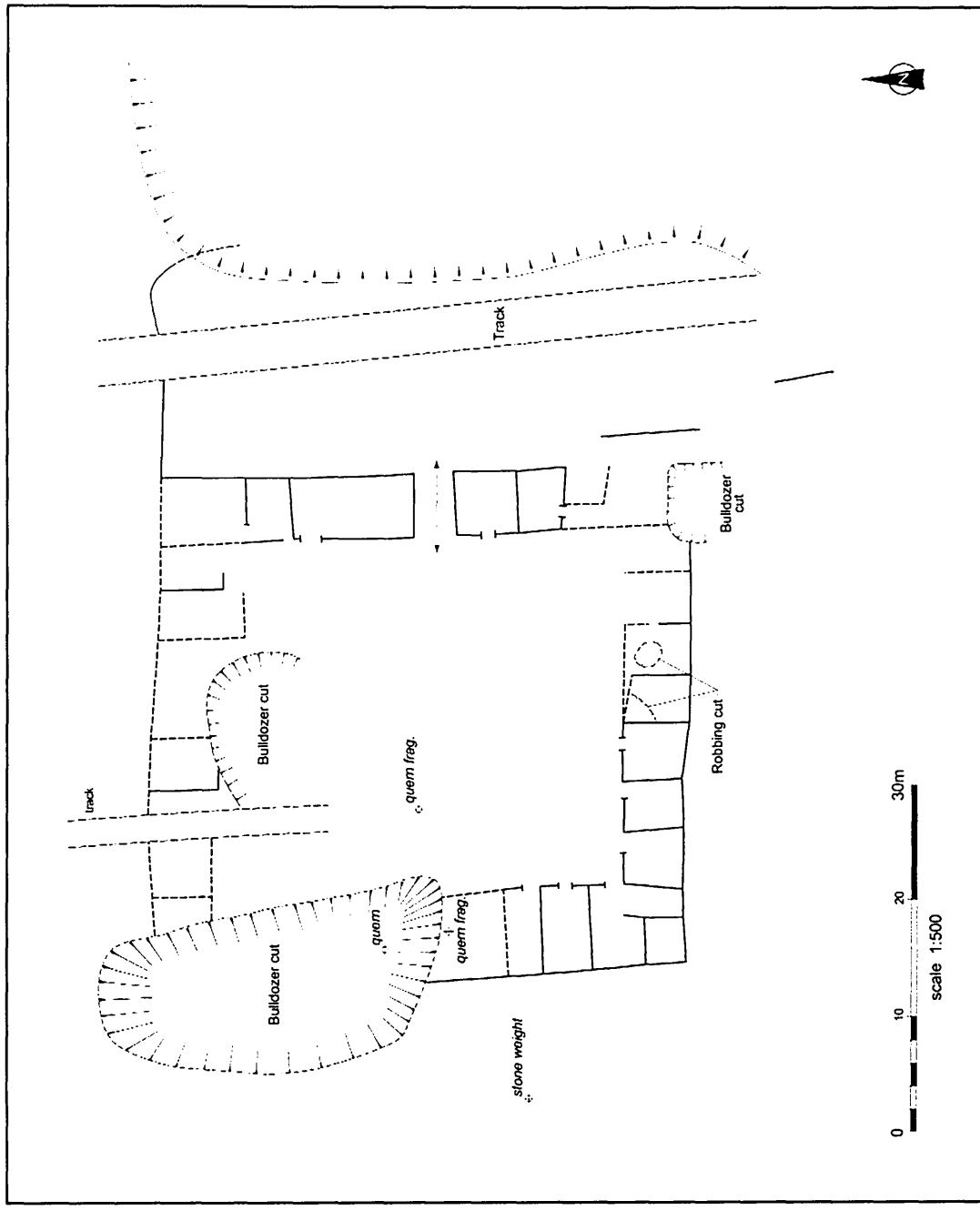



Figure 130 Plan DAS 331 Khirbat Al Mutrab

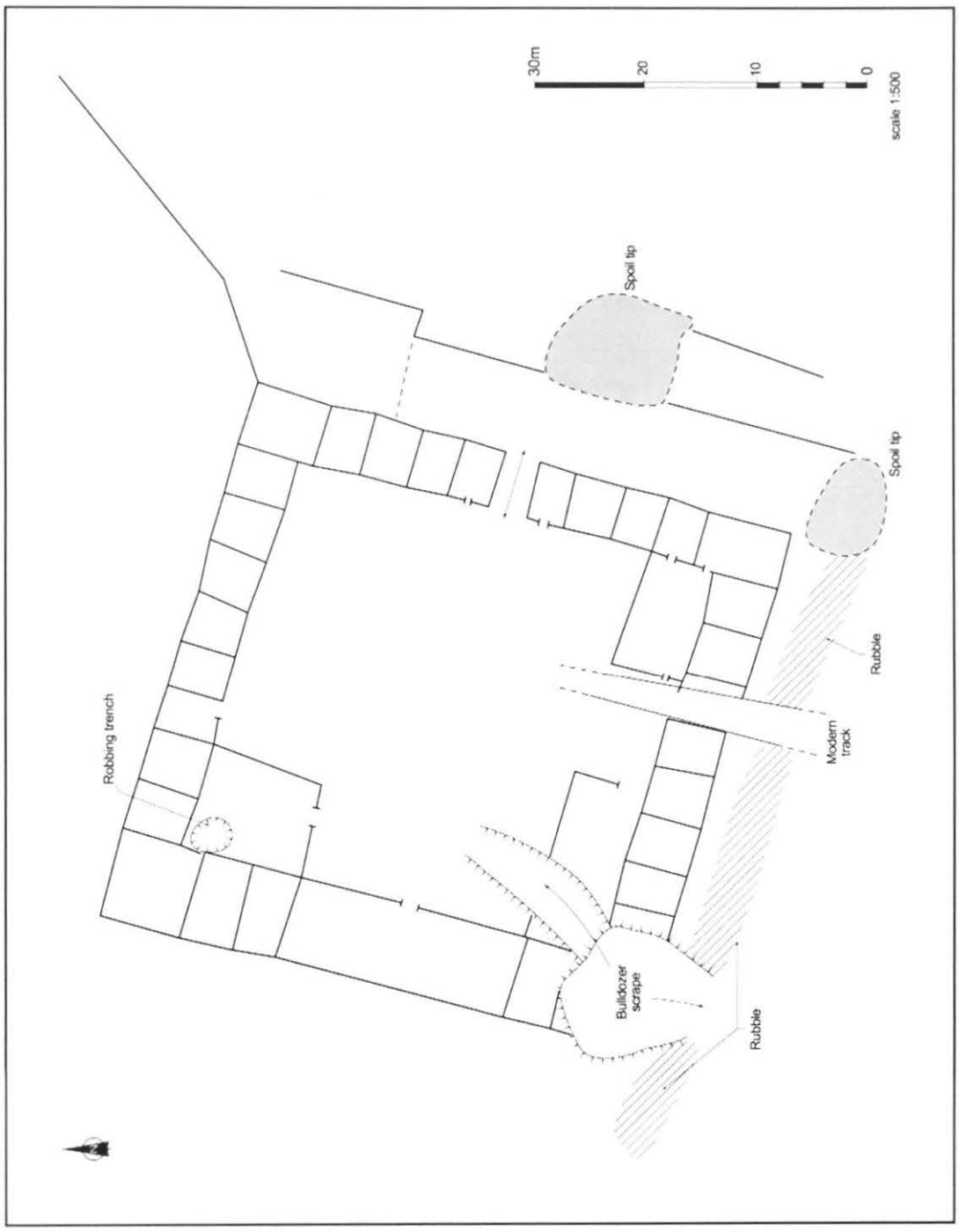



Figure 131 Plan DAS 332 Khirbat Samra

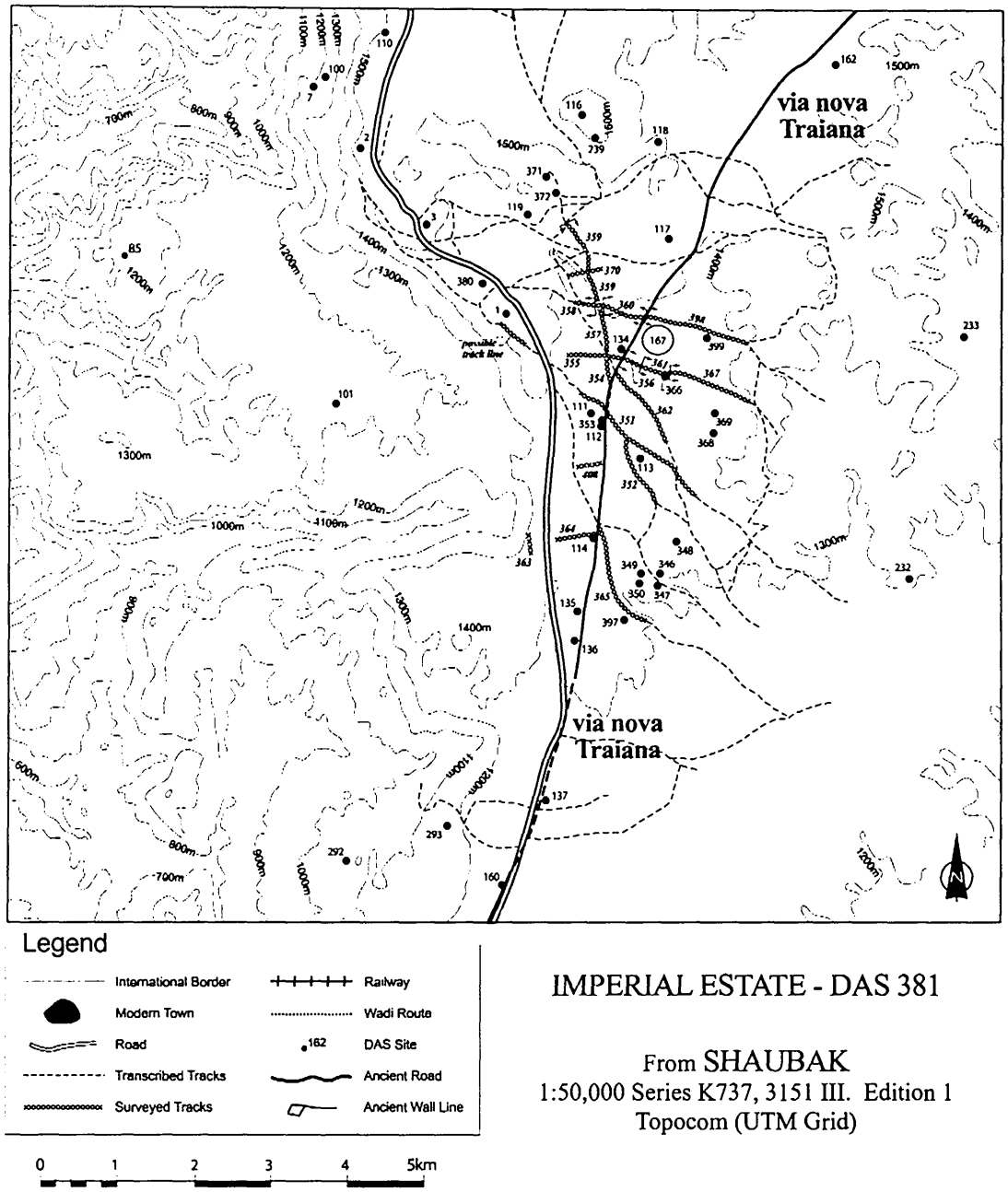



Figure 132 Map of Imperial Estate DAS Unit 381

Figure 133 Photo showing tracks within DAS Unit 381. *From Air Photographic Archive for Jordan Sheet No 25.039*

Figure 134 Photo track DAS 360

| DAS Site No. | Prehistoric | IA | Nabataean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Middle & Late Islamic |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | X | X | X | X | X | X | | X |
| 111 | X | | X | X | X | X | X | | |
| 112 | | | X | X | X | X | | | |
| 113 | | | X | X | | X | X | X | |
| 114 | | | X | X | X | | | | |
| 135 | | | | | | | X | X | |
| 346 | | | X | X | X | X | X | | X |
| 347 | | | | | X | X | X | | |
| 353 | | | | | | X | X | | |
| 366 | | X | X | X | X | X | X | | |
| 397 | | | X | X | | | | | |
| 399 | | | X | X | X | X | X | | |

Table 67 DAS 381 Sites associated with tracks

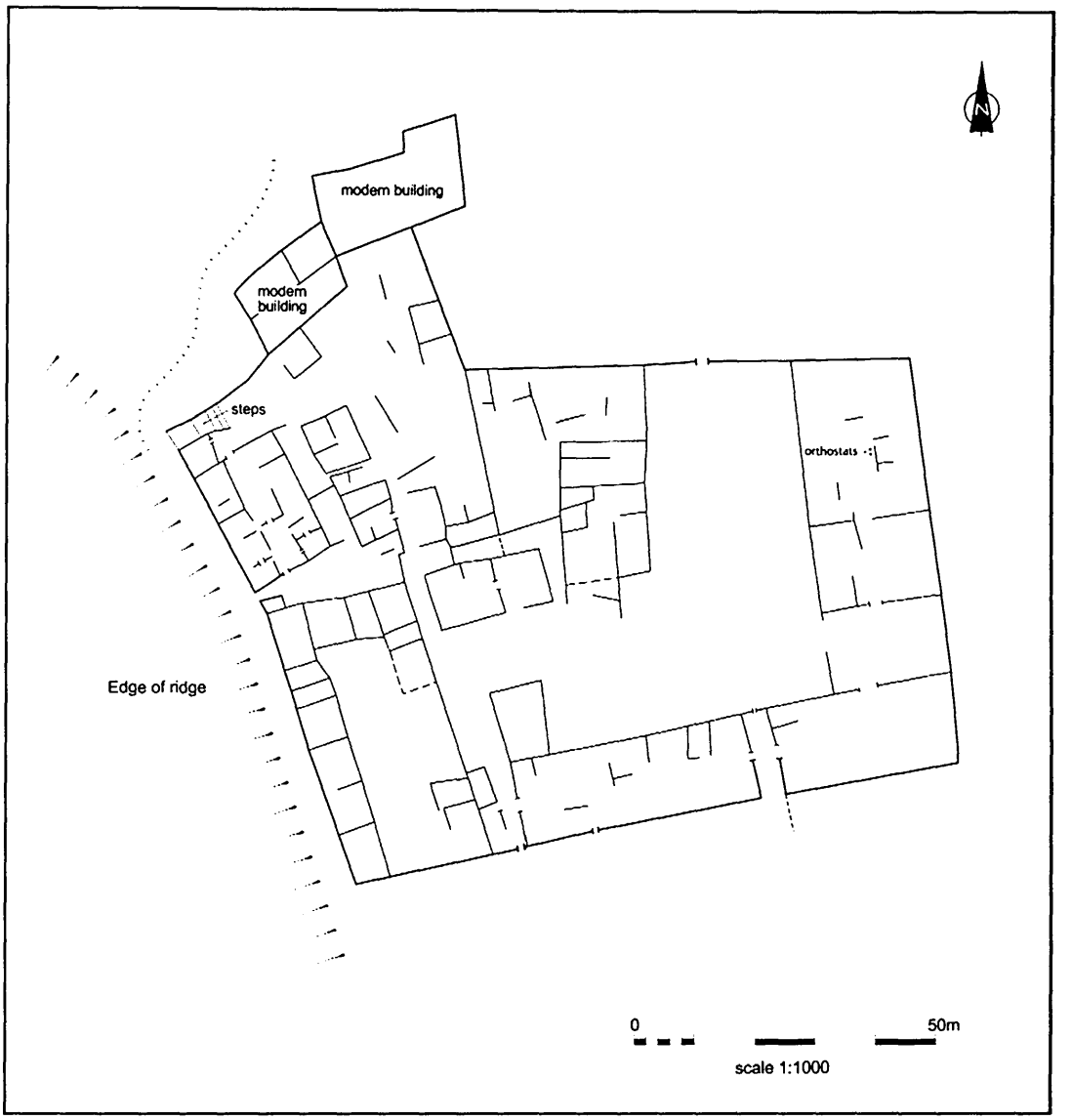



Figure 135 Plan DAS 1 Khirbat El Bir


Figure 136 Ptolemy II (285-246 BC) coin found at DAS 1 Khirbat El Bir

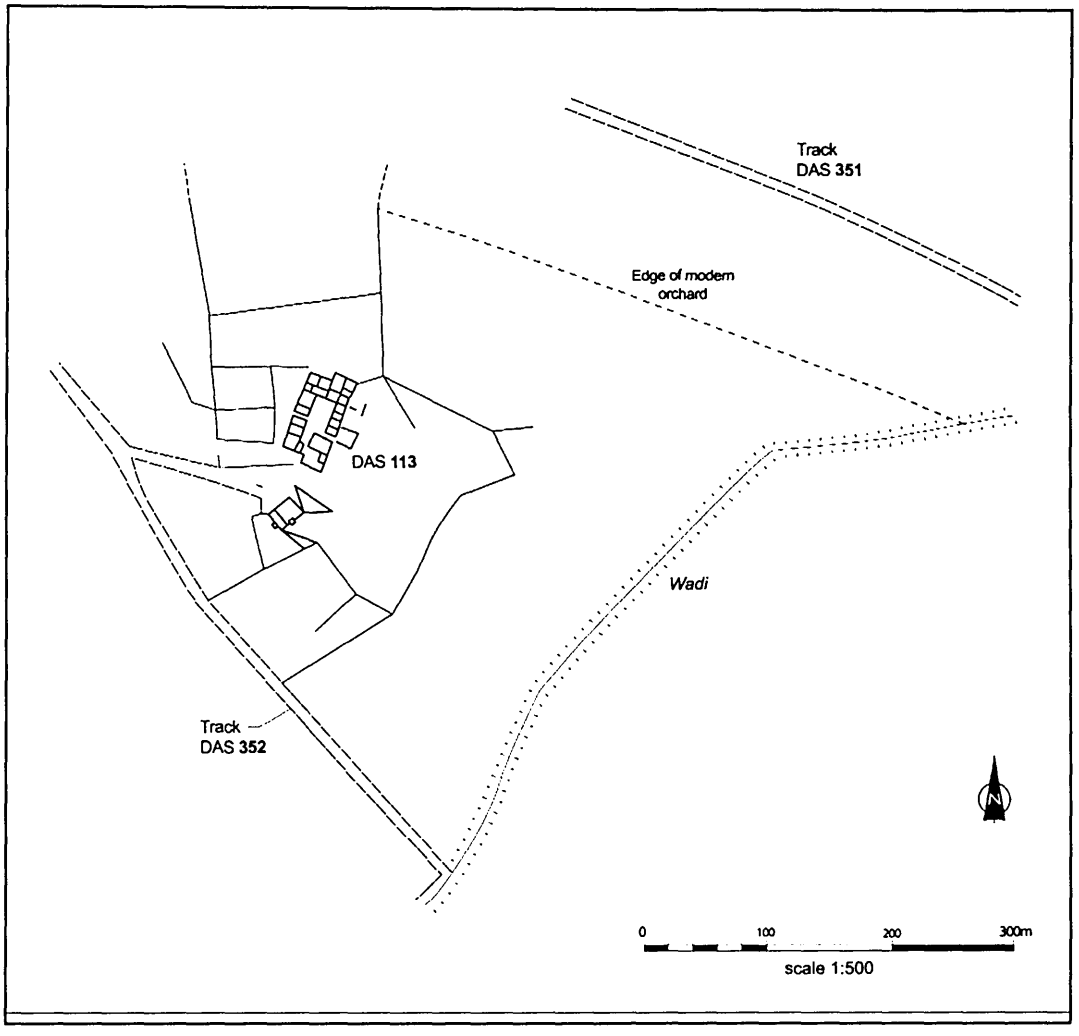



Figure 137 Plan DAS 113 Qasr Selim

| DAS Site No. | Prehistoric | IA | Nabataean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Middle & Late Islamic |
|---|---|---|---|---|---|---|---|---|---|
| 117 | | | X | X | X | X | | | |
| 368 | | | X | X | X | X | X | | |
| 369 | | | | | X | X | X | | X |

Table 68 DAS 381 Sites within track area

| DAS Site No. | Prehistoric | IA | Nabatean | Early Roman | Late Roman | Early Byzantine | Late Byzantine | Early Islamic | Middle & Late Islamic |
|---|---|---|---|---|---|---|---|---|---|
| 85 | | | X | X | X | | | | |
| 101 | X | | X | X | X | X | | | X |
| 116 | X | | X | X | X | X | X | | |
| 118 | | | | | X | X | X | X | |
| 162 | | | X | X | X | X | X | X | |
| 232 | | | X | X | X | X | X | X | X |
| 233 | | | X | X | X | X | X | | X |
| 239 | X | | X | X | X | X | | | |
| 371 | X | | X | X | X | X | X | | |

Table 69 DAS 381 Sites immediately outside track area

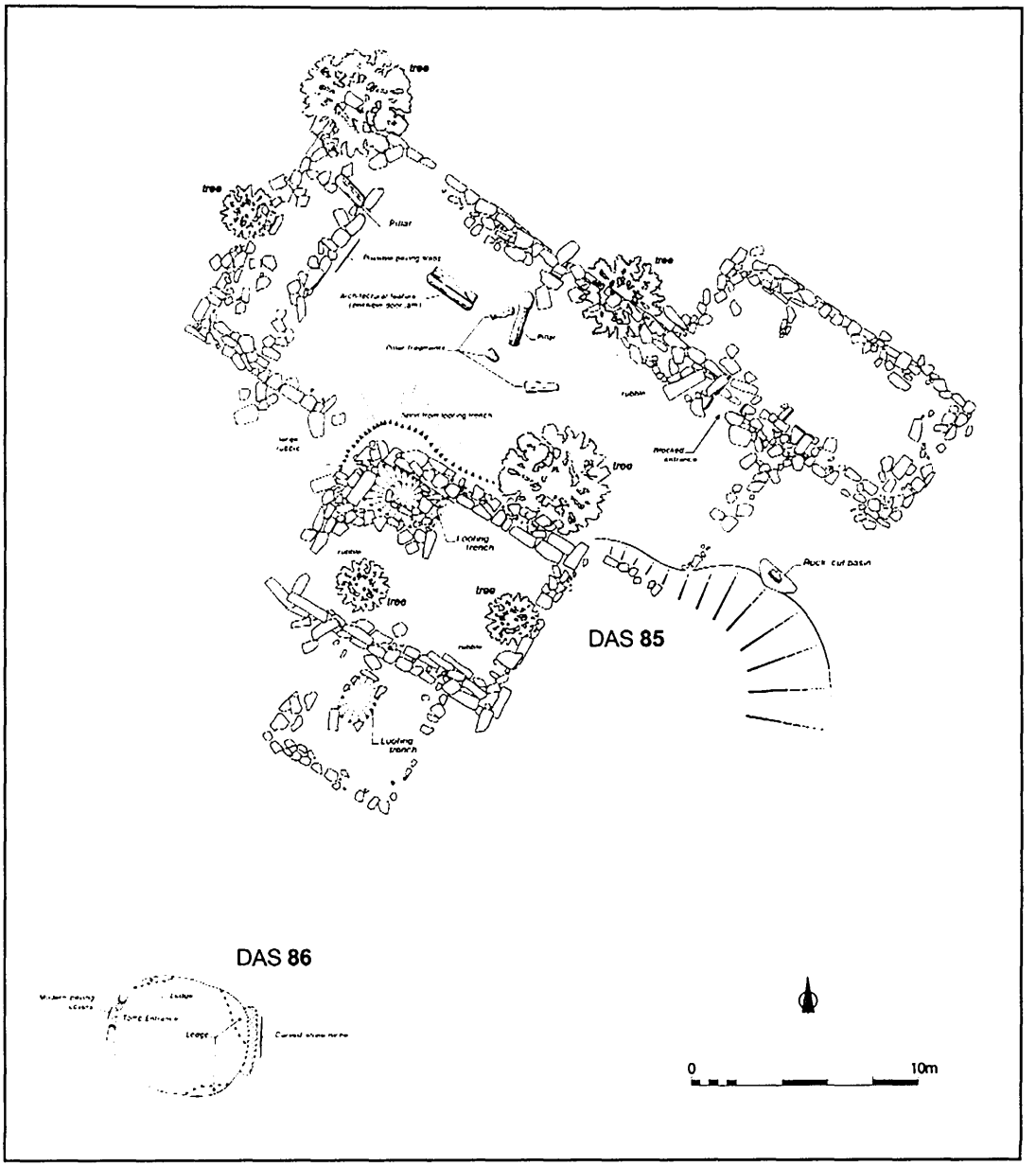



Figure 138 Plan DAS 85 Temple

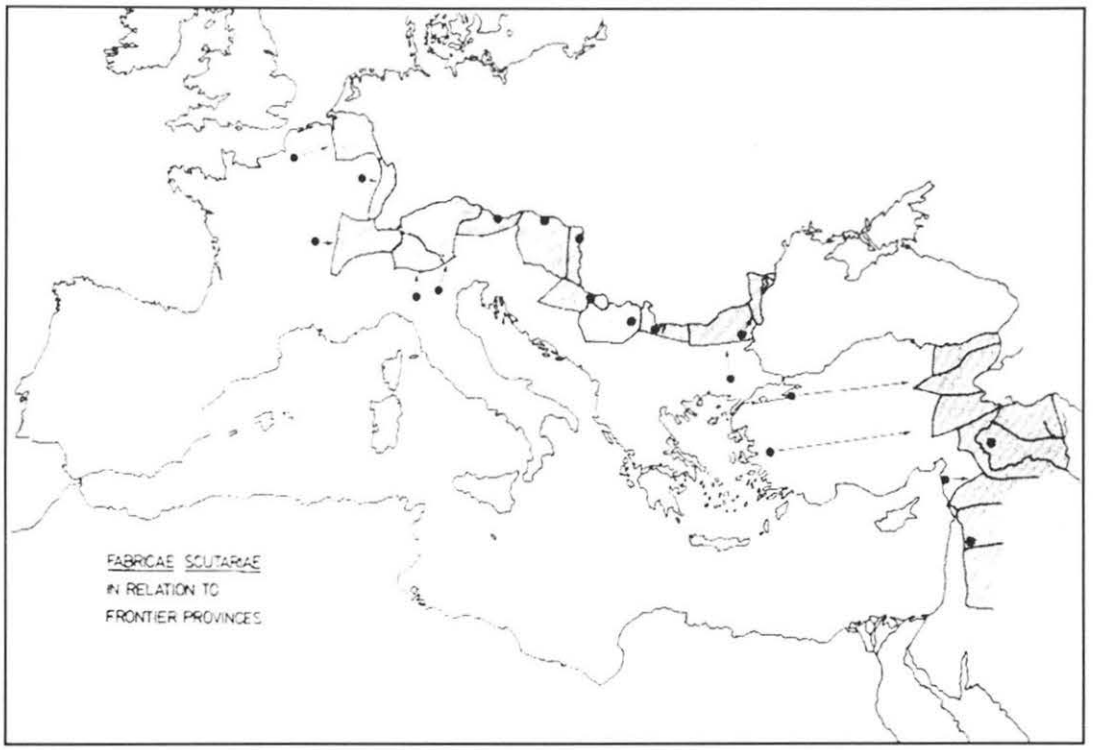



Figure 139 Map showing *fabricae* and Roman frontier areas. *From James 1988, 329 Fig. 5*

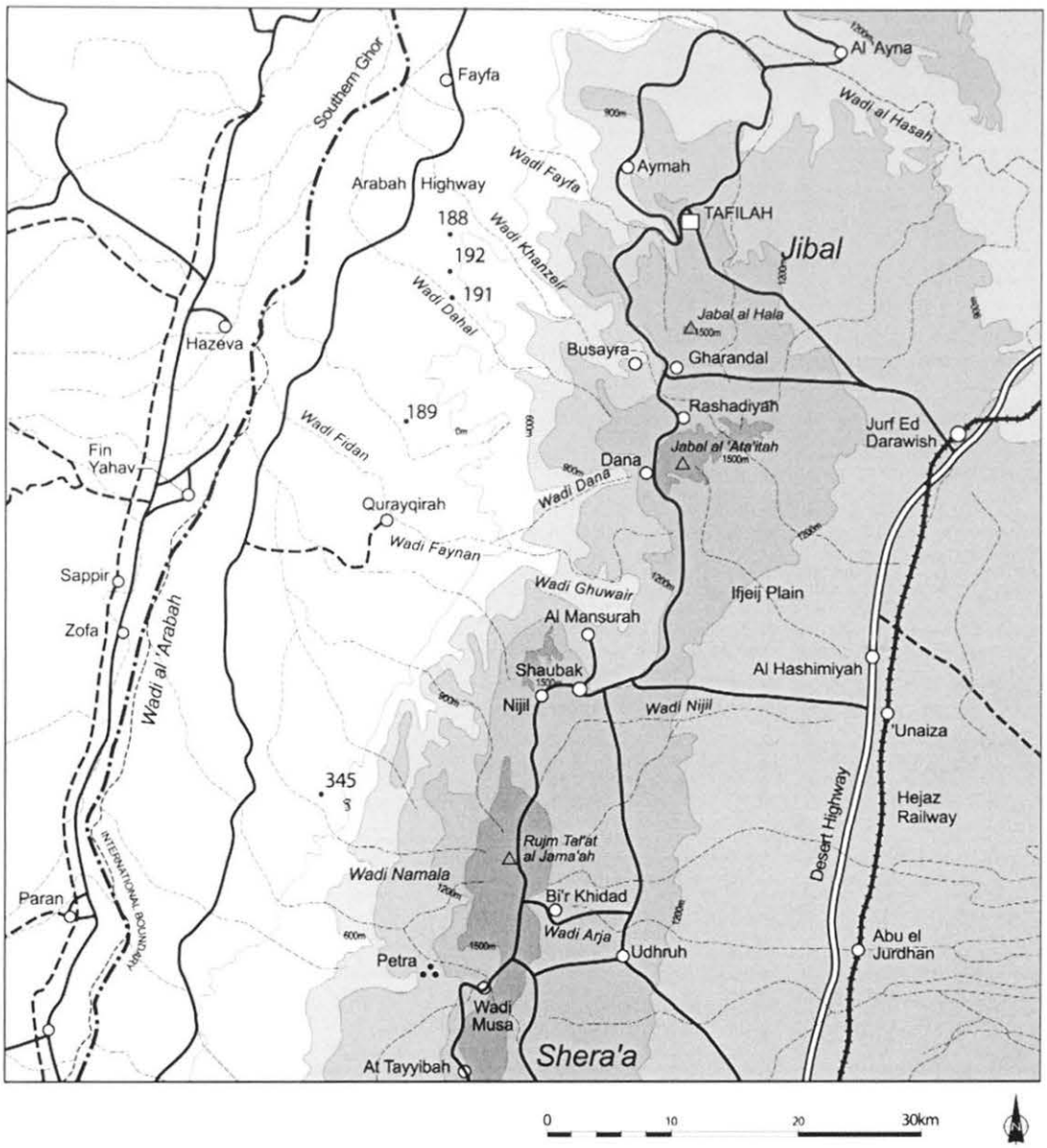



Figure 140 DAS sites in the Wadi Arabah

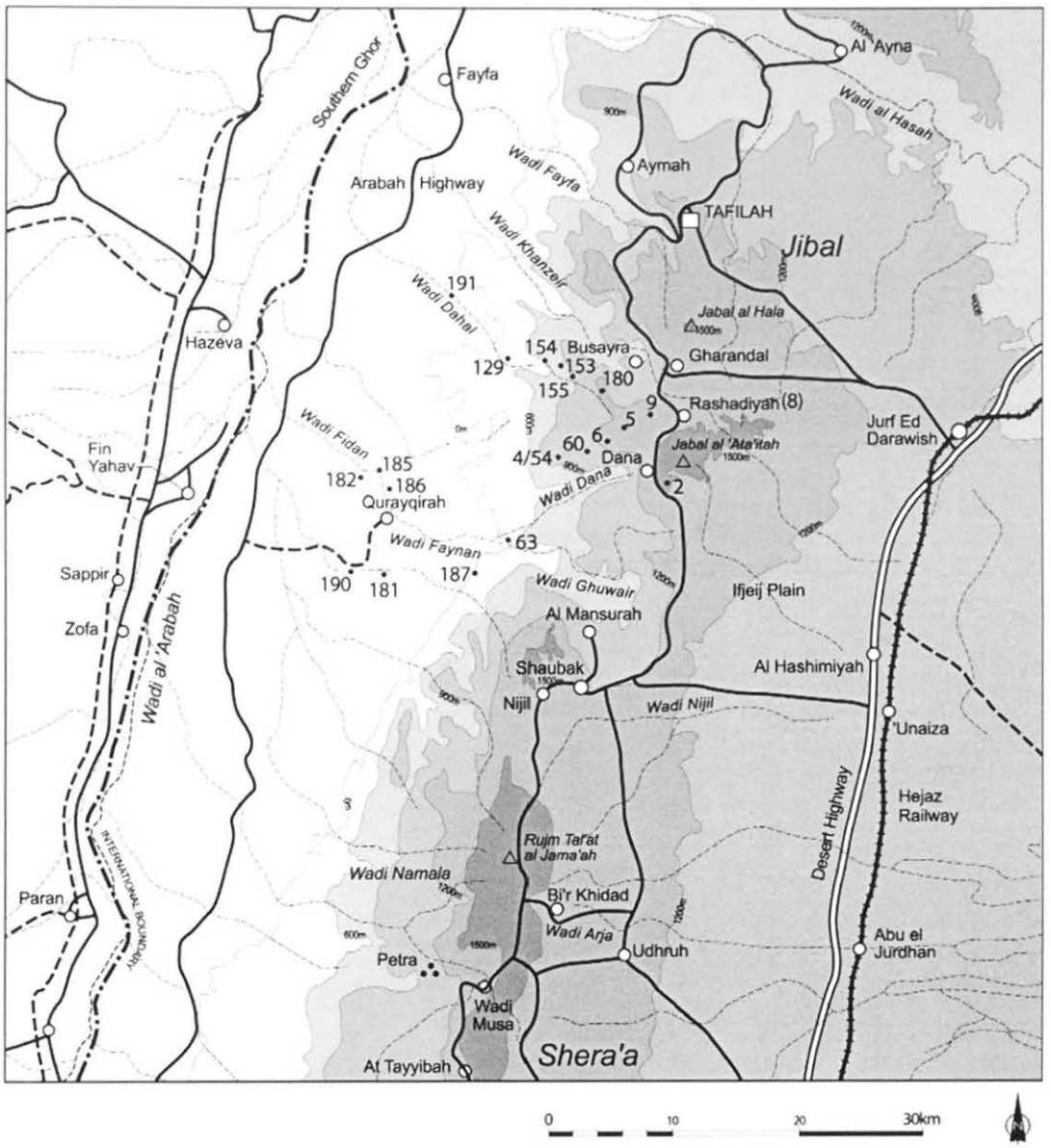



Figure 141 DAS sites on routes to Jordanian Plateau

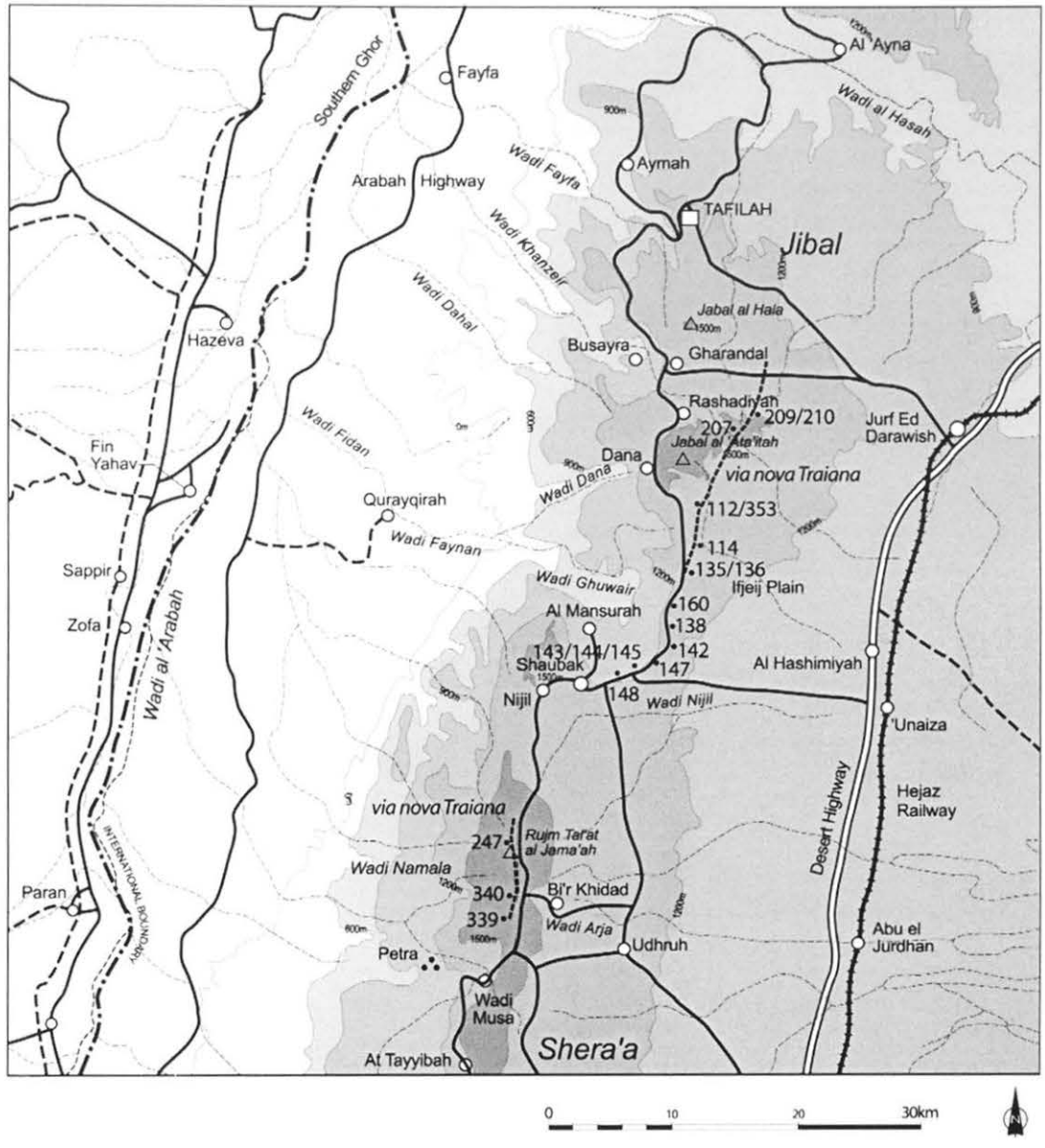



Figure 142 DAS sites on *via nova Traiana*

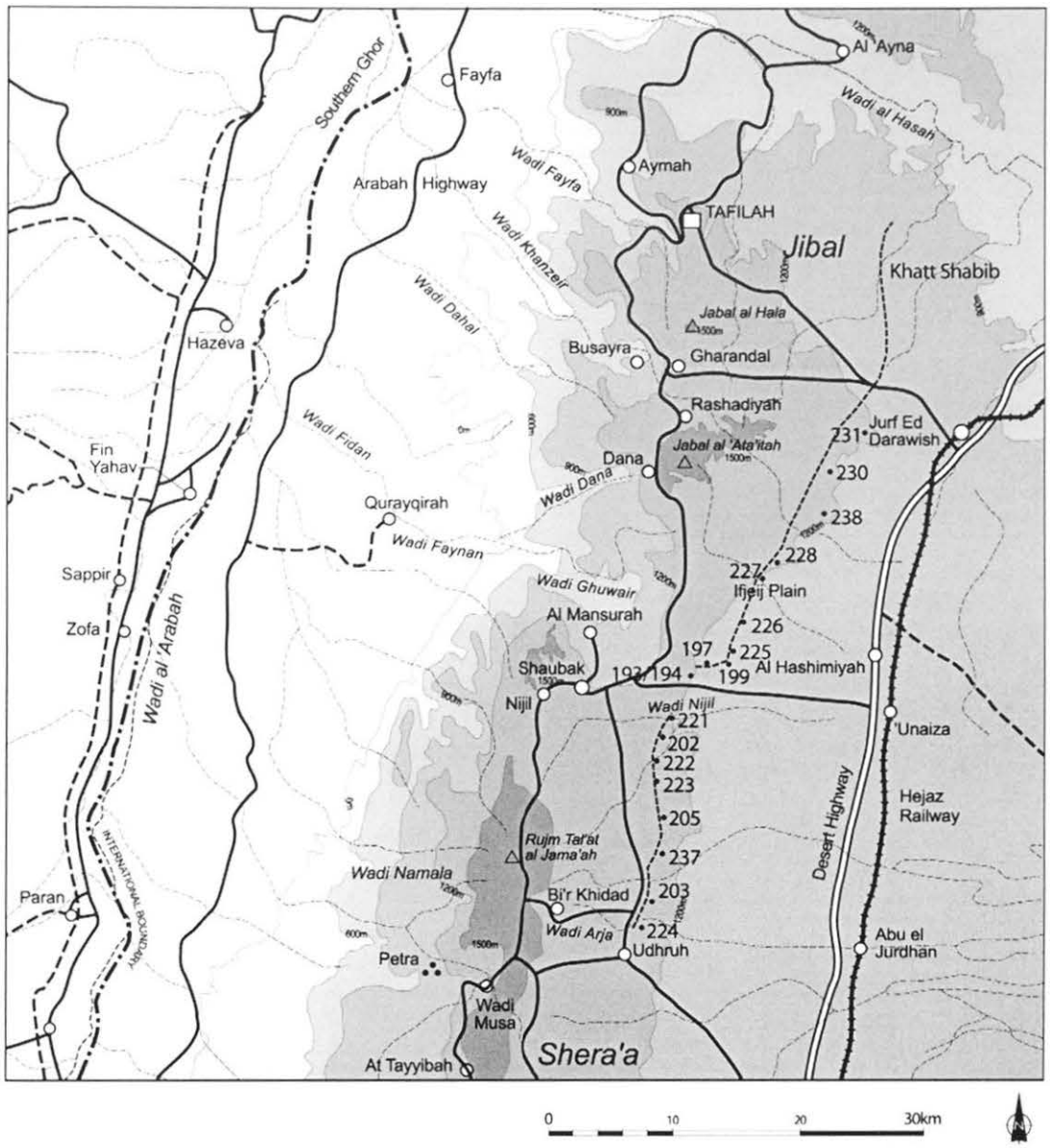



Figure 143 DAS sites associated with Khatt Shabib

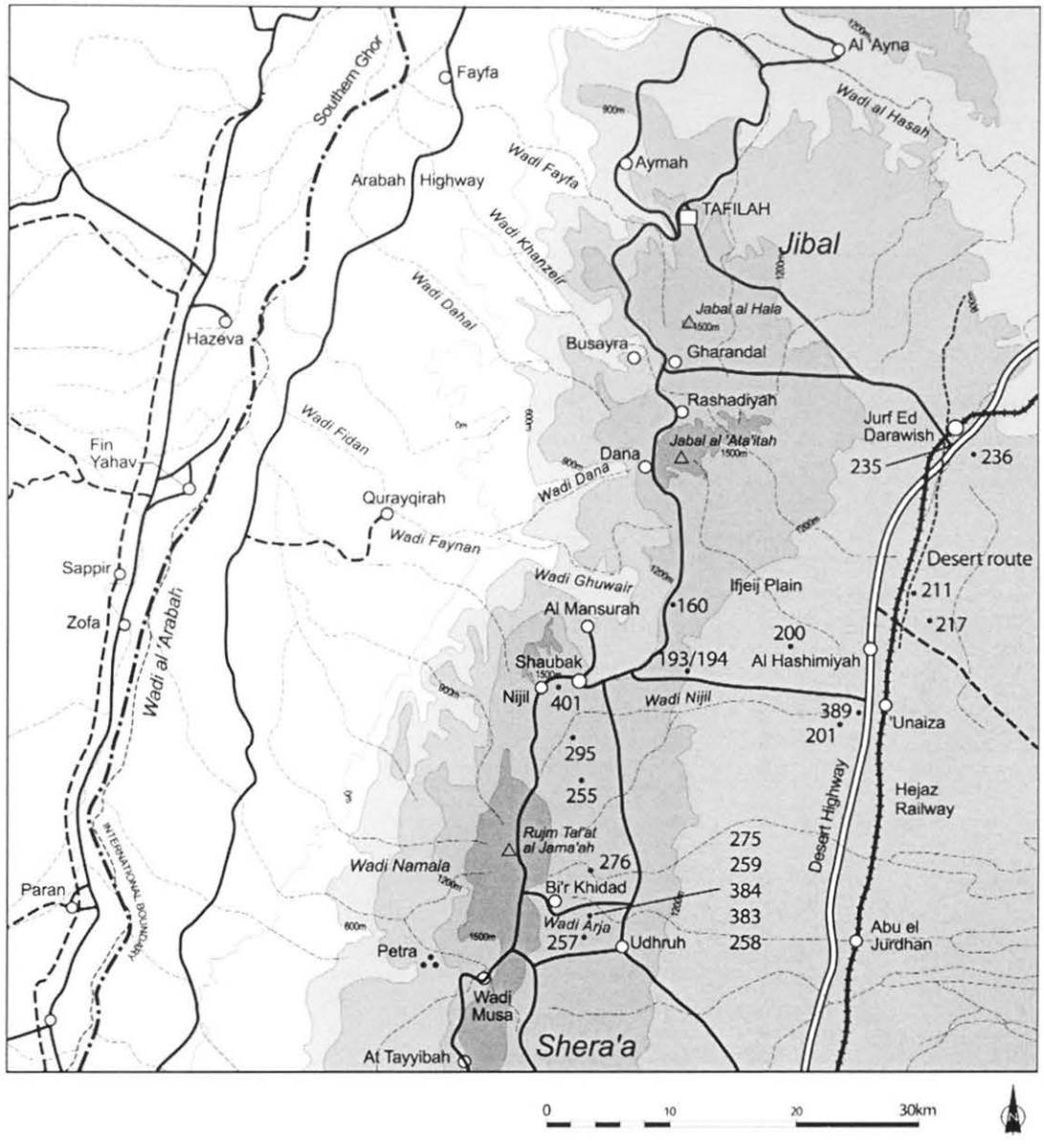



Figure 144 DAS sites on desert and cross-routes